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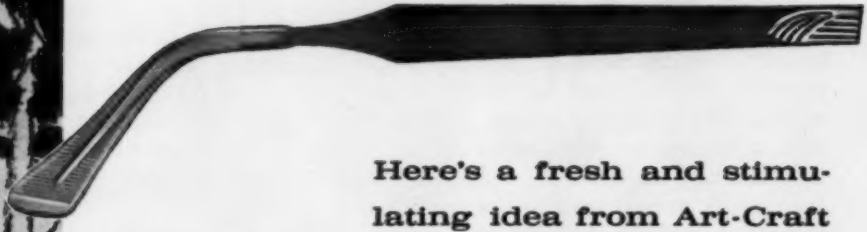

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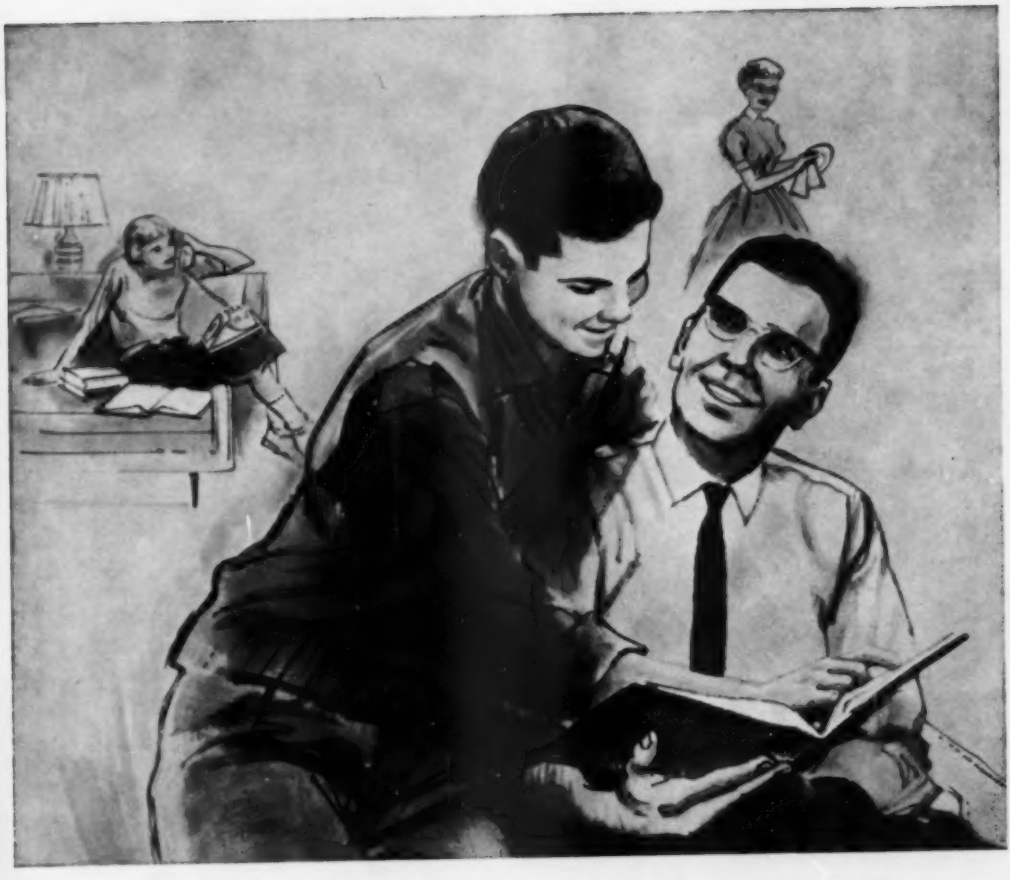

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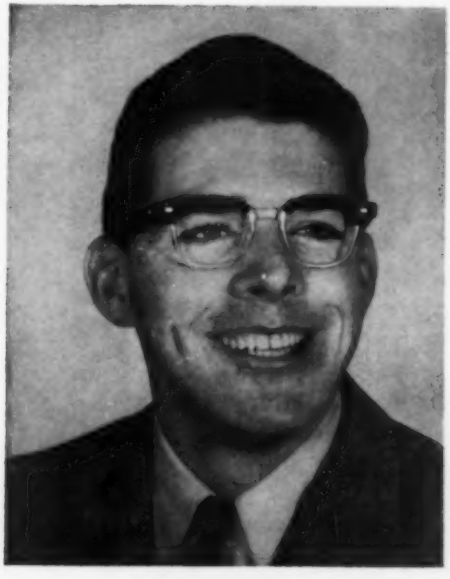

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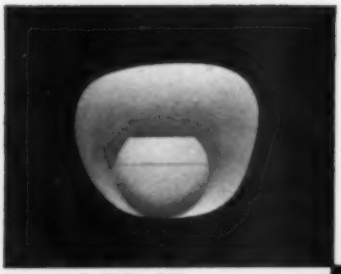

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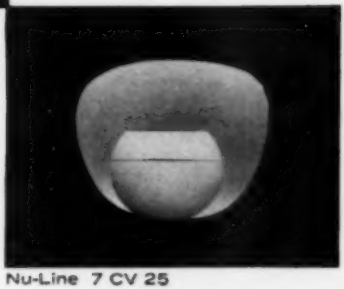

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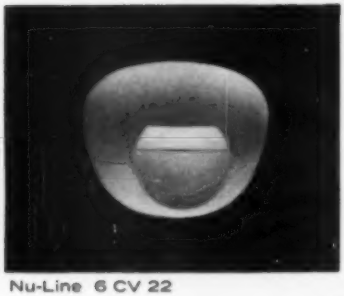

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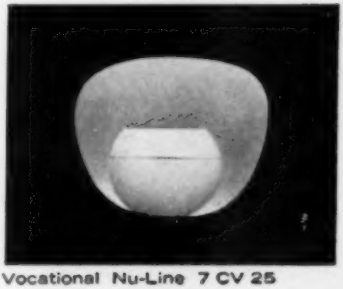

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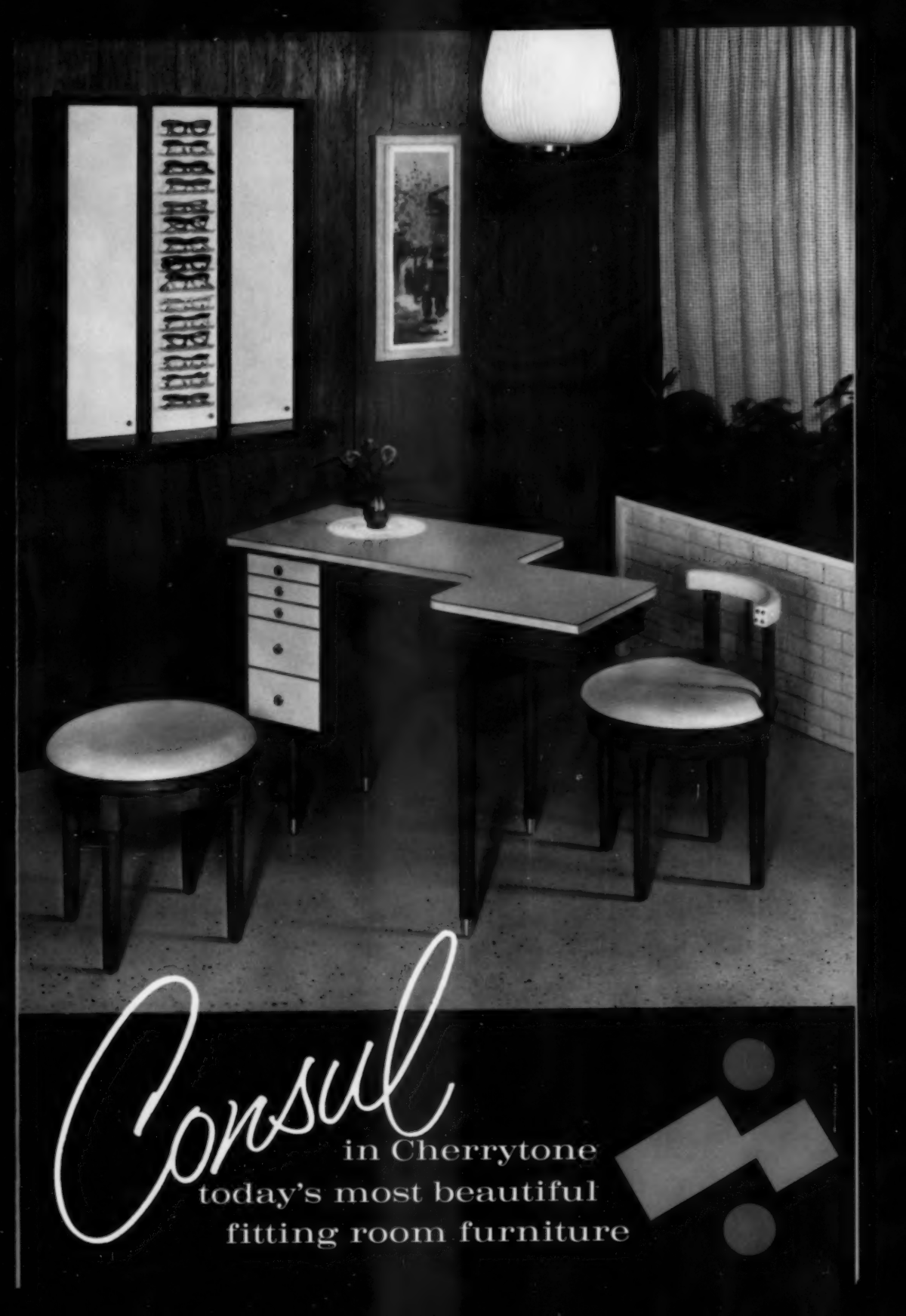
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☐ *A new astigmatic test chart.* Arthur A. Eastman and Sylvester K. Guth. 12 pages + cover. (1958). 35c.

Monograph 235

☐ *An evaluation of the Massachusetts vision screening test and its implication on the genetic theory of myopia.* Robert S. Arner. 16 pages + cover. (1958). 40c.

Shuron

A paper written by Roy Marks, President of Shuron Optical Company, was presented to the Academy of Optometry in December of last year on the subject of children's eyewear. The paper presented a study which was used by Shuron as the basis for the design of a completely new line of children's frames. These frames, soon to be marketed, are called Pedioptic Frames. The study revealed strong criticisms of present frames for children. Because of the importance of this subject, we are devoting this month's "Shuron Report" to an article by Mr. Marks.

ARE WE DOING ENOUGH for CHILDREN?

The "population explosion" talked about in newspapers, books and magazines is a very real fact in this country. And—as those concerned with the overcrowding of schools, for example, are only too well aware—the "explosion" means a substantial jump in the child population, both in total percentage and in absolute numbers.

Are we, as an industry, doing enough for these children? The answer—surprising and unflattering—is a resounding "No."

You may have read or heard about the recently announced extensive 2-year research programs, carried out by Shuron, on the subject of children's eyewear. This research made it very clear to us that today's frames for children fall deplorably short in the areas of sound design and structure. It furnished us with both motivation and opportunity to take a major step in fulfilling the discovered needs.

When we first decided to bring out a totally new line of children's frames, we were determined to do it on a scientific basis . . . to discover, with modern sampling methods:

1. Whether there was a need for a complete new design concept. 2. Why present frames were inadequate. 3. How they could be improved.

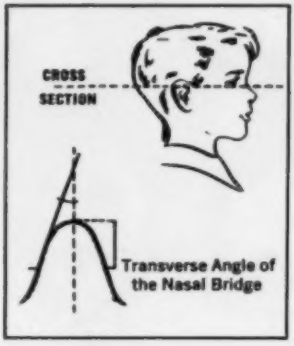
To carry out this part of the study, practitioners and suppliers in 12 major cities were interviewed, and parental attitudes towards children's eyewear were widely sampled at the world-famous Corning Research Center.

This fact emerged: We, as an industry, have done little or nothing—on a factual, scientific basis—to furnish the proper frames for the millions of children who need visual help. True, we're offered many scaled-down versions of adult frames; inverted the pads, taken steps to strengthen bridge and temple areas. But, as shown by the almost overwhelming verdict of both practitioners and parents, children's are still *far* from satisfactory . . . because, in general, they simply *do not fit!*

Report:

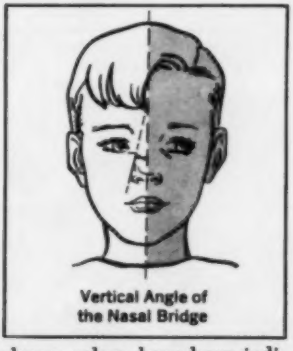
Since a good indication of this became evident very early in our study, we were convinced that something more was needed on which to base our frame designs: Actual anthropometric data on the shape and development of children's faces. We expected to find published research data, with results that we could interpret. Here was the surprise: *No such study* had ever been made! To get this information, we had to do the complete job. For this reason, the study required a full two years of intensive research.

We enlisted, first of all, the skillful cooperation of a renowned anthropologist at Columbia's College of Physicians and Surgeons. His aid was invaluable in setting up the study and in its subsequent completion . . . even to the extent of inventing a new measuring device for the purpose!



As a result of this data-gathering, Shuron now literally possesses the only set of scientific facts on the developmental changes, in two-year age groups, that occur as a result of the growth of the bony structure of the bridge of the nose and the orbital structure surrounding it. It was firmly established that children are *not* miniature adults; that there are definite differences in the bridge area, and that the most significant dimension is the transverse angle of the nasal bridge.

Somewhat surprisingly, the vertical angle of the nose—previously considered the important one—was found to remain practically constant through all periods of growth. Here again, research proved invaluable, in this case showing what is *not* so, even though it was previously acecpted as an obvious and general fact.



The next step was to translate the new data into frames. Shuron design engineers have done so. The new line is appropriately named **Shuron Pedioptic Frames.** The new bridge design, which accurately reflects the changes that occur as the child grows and matures, is called the ***Youthform*** Bridge.

Pedioptic frames are attractively styled, are available in carefully chosen colors, have been judiciously strengthened, and reflect traditional Shuron quality and attention to detail. But other manufacturers can make similar claims about their frame. Where, then, is the difference? The difference lies in the fact that Pedioptic frames are designed to fit children . . . real living, growing children . . . as they actually are, not as someone thinks they are.

I have taken this opportunity to discuss Shuron's answer to a tremendous need, and to tell you of some of the background of this dramatic new line of children's eyewear. Pedioptic Frames will be available to you very soon. I suggest, respectfully, that they present a wonderful opportunity to you . . . and to the children who are your patients.

Keep Abreast of Shuron news and products by watching for "Shuron Report" in this publication.

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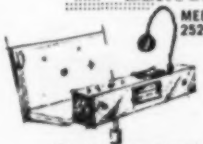

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Dr. Sheard was formerly editor of the *American Journal of Physiological Optics* and for many years director of the Department of Biophysics, The Mayo Foundation. The book contains 83 illustrations, 476 pages, $15.00.

CONTENTS

SECTION ONE – Selections from Editorials and Short Essays. SECTION TWO – Dynamic Ocular Tests. SECTION THREE – Dynamic Skiametry and Methods of Testing the Accommodation and Convergence of the Eyes. SECTION FOUR – Considerations Regarding the Analysis and Interpretation of Data on Ocular Accommodation and Convergence; Zones of Ocular Comfort. SECTION FIVE – Ophthalmic Optics with Applications to Physiological Optics. SECTION SIX – Ocular Photosensitivity and Dark Adaptation. SECTION SEVEN – Personalia.

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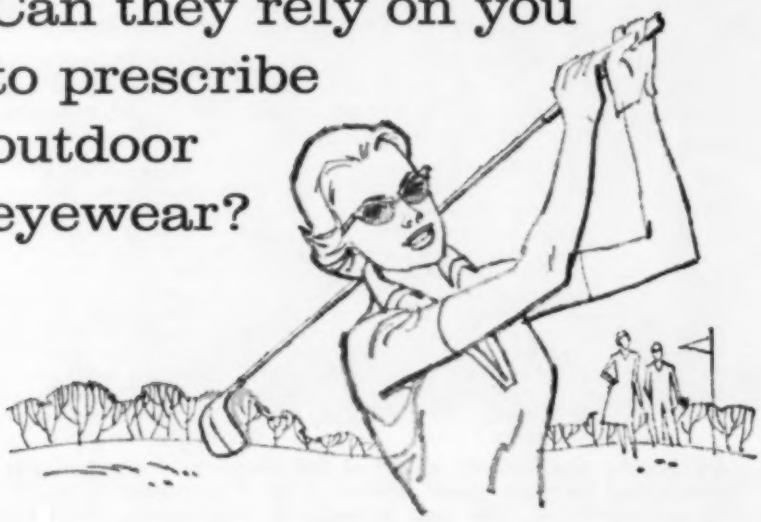

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Vol. 38 April, 1961 No. 4

SOME FACTORS FOR CONSIDERATION IN THE SELECTION AND FITTING OF CHILDREN'S EYEWEAR*

Roy Marks†
Shuron Optical Company
Rochester, New York

This paper is a report on several factors which relate significantly to children's frame fitting. This information appears to have considerable value as a result of two factors: 1) the population explosion that is upon us, and 2) the increased awareness on the part of parents as to the need for proper eyecare for the 5 to 14 age group.

Current population data show the following:

Age Group	Total Populaiton	Total Wearers	Annual Demand
	FEMALE MARKET		
5-9	8,803,000	871,000	871,000
10-14	7,345,000	1,785,000	1,150,000
Total	16,148,000	2,656,000	2,021,000
	MALE MARKET		
5-9	9,190,000	533,000	533,000
10-14	7,643,000	1,567,000	1,157,000
Total	16,833,000	2,100,000	1,690,000
Grand Totals	32,981,000	4,756,000	3,711,000

Considering the existence of 4,756,000 current wearers in the 5 - 14 age group and an annual demand of 3,711,000 due to new examinations combined with re-examinations, this age group can no longer be looked upon as an unimportant segment of the eye-care field nor can its effect on the economic health of the profession be ignored. When we add the factor of a total population in the 5 - 14 age group of 32,981,000 the enormous potential becomes obvious.

Few efforts have been made to design and produce spectacle frames for this age group. Studies did not reveal any significant work in obtaining orbital or nasal bone structure change information, the use of which could lead to more intelligent frame construction.

A study was undertaken, therefore, to provide information to enable frame designers to develop ophthalmic frames which would

*Read before the annual meeting of the American Academy of Optometry, San Francisco, California, December 12, 1960. For publication in the April, 1961, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.

†Optometrist, President of Shuron, Fellow, American Academy of Optometry.

provide comfort and optical accuracy and would be the best possible product for use by this large and relatively neglected segment of the public.

METHOD AND SCOPE OF STUDY

The study has been designed in three parts, as follows:

Part I—Anthropometric measurement of a sample of white children aged 3 through 18 to establish certain facts about the angulation and growth of the bridge of the nose.

Part II—Personal interviews with ophthalmic practitioners and supply houses in 12 cities.

Part III—A study at the Corning Opinion Center.

SUMMARY OF FINDINGS

Children are *not* miniature adults—at least not in the structure of the bridge of the nose. Facts developed in Part I of this study clearly indicate this and also the need for a different approach to bridge design to meet the needs of children in the 5-14 age group.

Part II of the study indicates that if frames were designed to take into account the anthropometric changes indicated in Part I, the ophthalmic practitioner would recognize the value of such design in overcoming fitting problems that currently exist.

Part III of the study indicates that no such previous information has been available to frame designers.

PART I—ANTHROPOMETRIC MEASUREMENTS

1—*Depth of the Nasal Bridge.*

Considerable information on this particular measurement has been available. A study was made, however, to bring this information up to date and the findings appear in Table 1.

Figure 1 illustrates the measurement taken. The line of the lower lid is the constant point of reference for the measurements. The depth of the nasal bridge has been measured from the top of the bridge at the midline to the base of the bridge as shown by the broken line in Figure 1.

The findings (Table 1) show that there is a significant increase in this dimension with age. An acceleration is noted in the rate of increase at approximately age 9 or 10. The number of patients in the sample was 154.

2—*Vertical Angle of the Nasal Bridge.*

This was considered to be a measurement of importance and is illustrated in Figure 2. The line of the lower eyelid is the constant point of reference. The vertical angle of the nasal bridge is the angle of the side of the nose with the midline as illustrated.

Figure 1. Depth of Nasal Bridge.

Table 2 shows that in a sample of 154 patients in a variety of age groups from 3 to 18 years, there was no significant variation and this measure can be considered unaffected by age.

3—*Transverse Angle of the Nasal Bridge.*

This measurement proved to be the key to this study and was designed especially for it. A special instrument, developed by Melvin L. Moss, Ph.D., Professor of Anatomy at Columbia University's College of Physicians and Surgeons, was used to take the measurements. The 80 boys and 74 girls, aged 3 to 18, who were measured were normal, well and without ocular or nasal deformation. They were selected from among visitors to the Clinics of the College of Physicians

TABLE 1

The Depth of the Nasal Bridge (at the Lower Lid)

Age Group	#	Mean	SD	Range
3 - 5	26	14.2 mm.	± 1.86	11.5 - 16.5 mm.
6 - 7	16	14.7 mm.	± 1.90	12.9 - 17.1 mm.
8 - 9	21	15.2 mm.	± 1.94	12.7 - 17.2 mm.
10 - 11	18	16.2 mm.	± 2.02	13.8 - 18.2 mm.
12 - 13	32	17.2 mm.	± 1.98	15.4 - 19.1 mm.
14 - 15	26	18.7 mm.	± 2.10	17.0 - 21.0 mm.
16 - 18	15	19.2 mm.	± 2.16	15.5 - 22.5 mm.
Total	154			

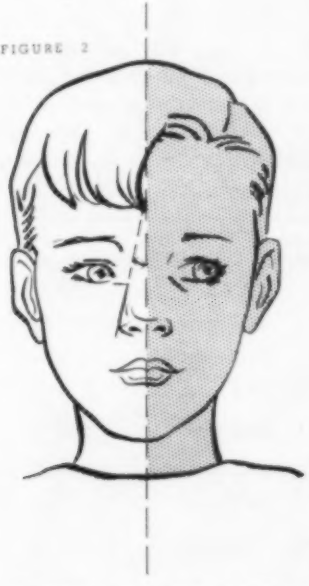
TABLE 2

Age Group	#	Vertical Angle of the Nasal Bridge Mean	SD	Range
3 - 5	26	19.9°	± 4.4°	14° - 30°
6 - 7	16	19.4°	± 5.3°	10° - 27°
8 - 9	21	20.5°	± 4.0°	14° - 31°
10 - 11	18	20.7°	± 2.7°	15° - 25°
12 - 13	32	19.3°	± 3.0°	15° - 24°
14 - 15	26	20.5°	± 3.7°	12° - 30°
16 - 18	15	18.9°	± 4.2°	11° - 26°
Total	154			

and Surgeons in New York City. Care was exercised to secure a good spread of types of individuals. The objective was to select a sample representative of children of northern European ancestry residing in the United States today.

A review of related published studies conducted by anthropologists

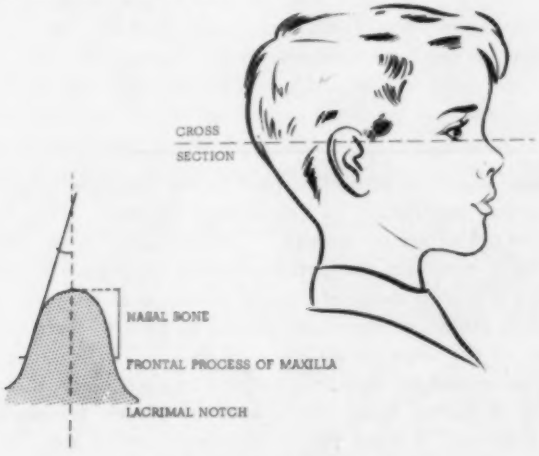
FIGURE 2



VERTICAL ANGLE OF THE NASAL BRIDGE

and personal communication with Dr. Howard Meredith of the State University of Iowa and Dr. Glenn A. Fry of Ohio State University assured that a sample of this size is adequate and sufficiently stable to establish the facts sought in the study.

Figure 3 below illustrates the transverse angle as measured. The line of the lower eyelid is the constant point of reference. The transverse angle of the nasal bridge is the angle formed by the nasal bones with the midline of the bridge.



TRANSVERSE ANGLE OF THE NASAL BRIDGE

FIGURE 3

Table 3 indicates that the transverse angle of the nasal bridge decreases with age.

Growth of the nasal bridge after age three is accomplished by a forward displacement of the nasal bones (which carry the apex of the bridge). During this growth in depth, the transverse angulation of the nasal bridge decreases in two ways: (1) The actual angle between the nasal bones decreases. (2) The apex is displaced forward from the base.

CONCLUSIONS

Differences related to sex need not be considered in the basic design of children's eyewear. The most sophisticated anthropometric approach arrives only at the fact that girls tend to be a year or so advanced over boys in the development of the bridge of the nose prior to puberty. The metric differences are so slight as to be negligible.

TABLE 3

Transverse Angle of the Nasal Bridge

Age Group	#	Mean	SD	Range
3 - 5	26	28.2°	± 6.9°	15° - 45°
6 - 7	16	25.3°	± 3.3°	20° - 30°
8 - 9	21	27.2°	± 5.5°	17° - 39°
10 - 11	18	26.9°	± 4.4°	15° - 34°
12 - 13	32	24.3°	± 5.8°	14° - 36°
14 - 15	26	21.5°	± 4.9°	11° - 31°
16 - 18	15	23.0°	± 4.0°	13° - 30°
Total	154			

Greater attention should be paid to the transverse angulation than to the vertical angulation in any sizing schedule. This is especially true for the pre-adolescent groups. The constancy of the vertical angulation greatly simplifies the possible variety of frames needed.

There is a wide range of normal deviation at all ages, as the tables show. More attention, therefore, should be paid to the standard deviations than to the mean values reported that follow for each age group.

It is recommended that design efforts be particularly directed toward fitting the shallower nasal depth and the greater transverse angle of younger children. A nasal pad of increased surface area, including the maxillary portions of the root of the nasal bridge will obviously give increased comfort and security of fit.

In general summary, a wider range of sizes with particular attention paid to the younger age group, 5-9, recognizing the need for a shallower nasal depth and the greater transverse angle in this group, should satisfy the major percentage of fitting requirements of children's frames.

PART II

One hundred personal interviews were conducted with practitioners in 12 major cities in an effort to learn the practical problems of frame fitting in the 5-14 age group.

The findings developed the following:

1—There is no manufacturer strongly entrenched in the children's eyewear field. There is an awareness on the part of the practitioner that children's frames now available leave many problems unsolved in the area of fitting the child's bridge structure.

2—Although the practitioner expects the child to look like a "miniature adult" when he puts on spectacles, he is aware of design features that call for special consideration in designing for the contours of the child's face.

3—A line of all-plastic frames in a limited number of colors should be adequate, provided a better fitting bridge is incorporated and the frames are available in a sufficient variety of sizes. Any features designed to strengthen the frame at the bridge and just behind the hinge rivets will be considered as plus values.

4—Possible consumer resistance to high end price carries an extra burden in children's eyewear of the problem of breakage and growth.

MAJOR CONSIDERATIONS IN FITTING CHILDREN'S EYEWEAR

1—Practitioners stress the lower, flatter or less developed bridge of the nose as the main source of fitting problems. The major considerations are, therefore, clearly associated with fitting the child's bridge structure.

2—Practitioners insist on a snug, secure fit at the bridge and a close fit at the temples. Some parents request looseness in these areas to provide for the child's growth but as a rule, this request is ignored. Any allowance for growth is usually made by using a large eye size and decentering the lenses.

3—Most practitioners prefer that the pad position be slightly lower than on present children's frames. The pad angle appears to be important as evidenced by the number who change this angle by use of plastic chips. About 30 per cent prefer an inverted pad, 70 per cent indicate no preference, overcoming the fitting difficulties by the use of chips.

4—The great majority of practitioners use riding bow temples for the 5-9 age group, after which they shift gradually to the skull type. The breakdown shows 90 per cent riding bow and 10 per cent skull in the 5-9 age group, and the figures reverse with teenagers.

Matters concerning eye size and difference, patterns and colors as well as styling were discussed during these 100 interviews but the findings are not considered pertinent enough to be within the scope of this paper.

5—Breakage factors were discussed at length and as suspected, most children's frames are weak in the bridge area. Breakage in the temple just behind the hinge is considered a major problem and this needs to be improved.

PART III—THE STUDY AT THE CORNING GLASS WORKS OPINION CENTER

Arrangements were made at the Corning Glass Center, Corning,

N. Y., to utilize their Opinion Center to question parents concerning their ideas on several aspects of children's eyewear. The following queries were made and the responses tabulated.

1—Other than proper fit, what was the most important consideration when your child's eyeglass frames were selected?

Appearance	169
Material	55
Price	19
All Others	10

2—Does the frame cause any discomfort?

No	133
Slips Forward	47
Hurts Ears	26
Hurts Nose	18
Others	28

3—If frame has broken, where did it break?

Bridge	76
Rim	22
Temples	21
Hinge	59
At Bend	18
No Answer	60

4—What, particularly, do you like about your child's spectacle frames?

Color	40
Styling	42
Durability	17
Lightweight	10

5—What things, in particular, do you dislike about your child's spectacle frames?

Nothing	121
Too Heavy	26

The remainder of the responses were spread over 23 different reasons.

In summary, this study has developed the following facts:

1—The population explosion as related to the 5-14 age is of such size as to make this segment of the population an important consumer in the eyecare field.

2—Greater attention must be paid to bridge design with particular attention to the anthropometric factors. Of the three factors studied, the Transverse Angle of the Nasal Bridge is the most important. Heretofore no data have been available concerning this important measurement.

3—A wider range of sizes is needed to take care of the rapid changes in the 5-9 age group due to the change in the nasal depth and the greater transverse angle.

4—Practitioners have difficulty in properly fitting children's frames for a variety of reasons previously stated.

5—Parents indicate that current frames do cause some discomfort.

6—Parents are motivated in their selection by style and color.

7—Children in the age group 5-14 do have breakage problems, particularly at the bridge, hinge, rim and the temple area directly behind the hinge.*

*The author is grateful to Henry J. Peters, O.D., Oakland, California, for his help in making the presentation of this paper possible.

ANNOUNCEMENT

OMA APPROVES BOXING METHOD OF MEASURING FRAME AND LENS SIZES

At a meeting of all Optical Manufacturing Association Frame Manufacturers, New York City, March 16, 1961, the boxing method of measuring frame and lens sizes was adopted as the industry standard. The meeting was presided over by OMA President Emanuel Nathan.

The new Industry Standard, which has been under study for several years, provides for an effective date of January 1, 1962, for manufacturers to change over on all new frames introduced after that date. Manufacturers may change over at an earlier date.

The following points were agreed to at the meeting:

1. That the boxing system be adopted for designating pattern and lens sizes.
2. That frames be designed around the boxing system for DBL and eyesize.
3. That "Boxed" measurements be stamped on all frames.
4. That envelopes, descriptive literature, etc., carry any additional information deemed necessary for the laboratory and fitter, such as the 180° line measurement, which is also known as the fitting value.
5. That the new "boxed" patterns used in cutting and edging lenses be standardized to a length of 46.5 mm. with standardization of holes, hole separations, and other dimensions as agreed to by the OMA Pattern Committee.
6. That a symbol be stamped on all frames after January 1, 1962, to indicate that the measurements given are "boxed," such as 46 □ 20.

THE RELATIONSHIP BETWEEN REFRACTIVE ERROR AND VISUAL ACUITY AT THREE AGE LEVELS*

Henry B. Peters†
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The relation between refractive error and visual acuity is of significance to clinical practice and to vision screening. In the former this information is important to estimating the consistency of the data collected on an individual patient, in evaluating the presence or absence of amblyopia, in assessing the influence of pathology, and other similar considerations. In vision screening many techniques utilize measures of visual acuity as the means of determining the presence or absence of vision problems. There is an assumed or implied relationship between visual acuity and refractive errors.

Most of the studies of this relationship have used the technique of averaging the two principal meridians of each eye to obtain a measure of refractive error known as the "equivalent sphere." This method effectively masks the influence of astigmatism and equates a refractive error of +2.00 Diopter sphere combined with —3.00 Diopter cylinder as equal to +0.50 Diopter sphere. By the means of the "equivalent sphere" technique these may be "equal" refractive errors, but most surely will not result in equal uncorrected visual acuities. Since about 5 per cent of the population has astigmatism that exceeds one diopter this is an important consideration.

In developing the Orinda Vision Study[1] a new technique was devised for showing this relationship and a supplementary study was included in the report containing this material. This method showed clearly the influence of hypermetropia, myopia and astigmatism on visual acuity and provided some pertinent information for vision screening. This study was done on children from age 6 to age 13 years. Since this relationship is important for other age groups as well, it was decided to extend this technique to other population samples to show the influence of age on this relation.

THE SELECTION OF CASES

Three age levels were selected for study: Group I consisted of 2,452

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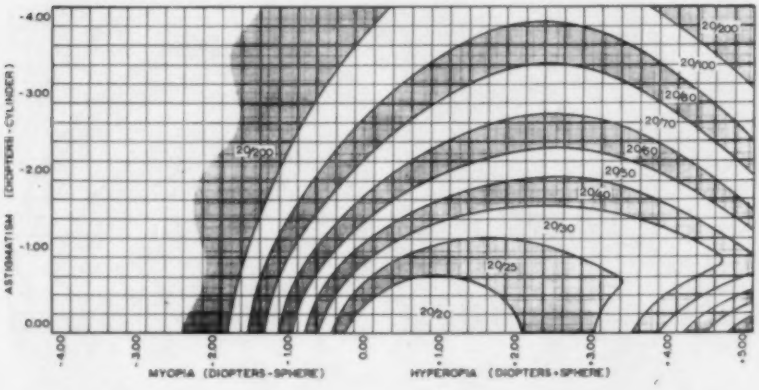
FIGURE 1
RELATION BETWEEN REFRACTIVE ERROR AND VISUAL ACUITY
AGE 5-15
MEAN ACUITY FOR EACH REFRACTIVE ERROR PLOTTED WITH LINES OF ISO-OXYOPIA
N = 2452



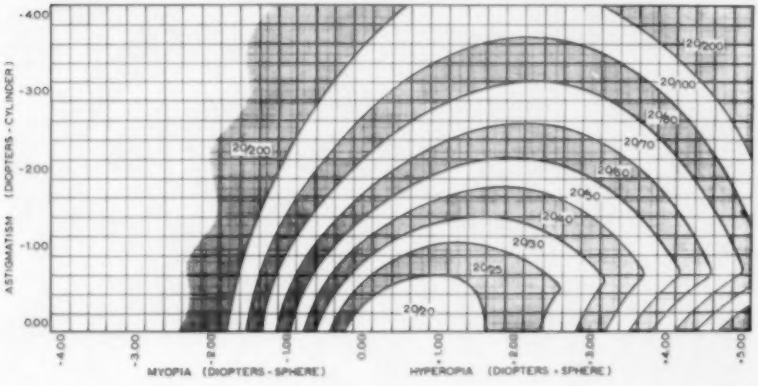
eyes of individuals between the ages of 5 and 15 years; Group II consisted of 2,616 eyes of individuals between the ages of 25 and 35 years: Group III consisted of 2,183 eyes of individuals between the ages of 45 and 55 years. All eyes selected for consideration were free of pathology and medical anomalies that might effect visual acuity. All had visual acuity of 20/20 when corrected with appropriate lenses. Many thousands of clinical records were searched to find the cases here reported in order to obtain an adequate sample of the higher levels of astigmatism.

The aim was to find five or more qualified cases for each combination of sphere and cylinder from —4.00 to +5.00 Diopter sphere and zero to —4.00 Diopter cylinder in quarter-diopter steps. In the higher amounts of myopia and compound myopic astigmatism visual acuities of less than 20/200 were consistently found and thus little effort was made to fill in all the refractive errors in this range. Similarly, for some of the refractive error values of high mixed astigmatism and high hypermetropic astigmatism, relatively fewer cases were obtained even after extensive searching. The cases were selected from the clinic records of the School of Optometry at the University of California and author's private practice.

THE METHOD

The refractive errors and associated uncorrected visual acuities were recorded on 16 arrays, one for each value of astigmatism from zero to —4.00 Diopters cylinder in quarter-diopter steps. The spherical

FIGURE 2
RELATION BETWEEN REFRACTIVE ERROR AND VISUAL ACUITY
AGE 25 - 35
MEAN ACUITY FOR EACH REFRACTIVE ERROR PLOTTED WITH LINES OF ISO-OXYOPIA
N = 2616



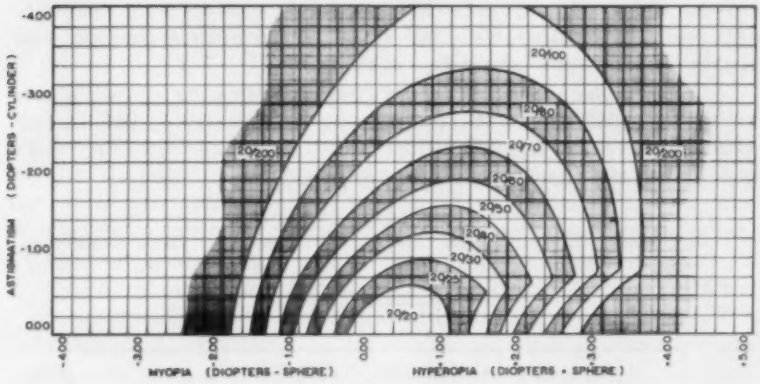
power from —4.00 to +5.00 Diopters was expressed as the ordinate and visual acuity was expressed along the abscissa. On each array a mean value of the visual acuity was calculated for each spherical value. These mean values were plotted with spherical power as the abscissa and visual acuity as the ordinate giving a smooth curve for each value of astigmatism. These data were replotted with cylinder power as the ordinate and spherical power as the abscissa giving smooth curves for each value of visual acuity. These are the lines of iso-oxyopia—equal visual acuity. This was repeated for each age group.

THE RESULTS

The results of this investigation are expressed in three graphical presentations, Figures 1, 2 and 3. It is apparent that visual acuity decreases with increasing myopia at all age levels in a uniform manner. But the relation between visual acuity and hypermetropia is considerably different and changes with age, particularly with the onset of presbyopia as shown in the graph of the 45-55-year-olds. Uncorrected visual acuity is shown to decrease with age for those with hypermetropia. Small amounts of astigmatism, expressed in minus cylinder, increase visual acuity in the higher values of hypermetropia. But astigmatism of over 0.75 Diopter decreases visual acuity in all combinations of spherical power.

These graphs may be used in two ways. The most likely visual acuity for any refractive error may be read directly. The effect of

FIGURE 3
RELATION BETWEEN REFRACTIVE ERROR AND VISUAL ACUITY
AGE 45-55
MEAN ACUITY FOR EACH REFRACTIVE ERROR PLOTTED WITH LINES OF ISO-OXYOPIA
N= 2183



myopia, hypermetropia, astigmatism, and various combinations of these can be seen. The influence of age on the relationship between refractive error and visual acuity can be observed by comparing the three figures. These graphs should be useful to the clinician in estimating the consistency of his data on an individual patient. While it is possible to use this graph to estimate the uncorrected visual acuity when the refractive error is known it is obvious that it is not possible to estimate the type or amount of refractive error from a given value for visual acuity.

Secondly it is possible to estimate the types and amounts of refractive errors which will be found in the "pass" and "fail" groups when a specific visual acuity value is used as a criterion in vision screening at a particular age level. For example, if 20/40 is chosen as the "failure" line, myopia of up to —0.50 D.S., hypermetropia up to +4.75 D.S. and astigmatism in certain combinations up to —1.50 D.C. would be expected to "pass" at the 5-15 years age level. At the 45 - 55 age level the same screening standard would "pass" myopia up to —0.50 D.S. hypermetropia up to +1.75 D.S. and astigmatism in various combinations up to —1.00 D.C. Vision screening using visual acuity should take these variations into account.

SUMMARY

A new graphical method is presented to show the relation between refractive error and visual acuity that clearly shows the influence of

myopia, hypermetropia, astigmatism and various combinations of these.

Graphs are presented to show this relation at three age levels, 5 - 15, 25 - 35, and 45 - 55. Uncorrected visual acuity for those with myopia and certain myopic astigmias remains constant with increasing age, while it decreases with age for those with hypermetropia and certain hypermetropic astigmias.

The graphs are useful to clinicians in estimating consistency of examination data and to those developing vision screening tests in estimating the types of refractive errors to be found in the "pass" or "fail" groups for each visual acuity cut-off point at each age level.

REFERENCES

1. Blum, Henrik, Henry B. Peters, and Jerome W. Bettman. Vision Screening for Elementary Schools: the Orinda Study. Berkeley, Calif., University of California Press, 1959.

ANNOUNCEMENT

WESTERN COLLEGE ASSOCIATION ACCREDITS LOS ANGELES COLLEGE

Academic accreditation as a specialized institution by the Western College Association has been granted to the Los Angeles College of Optometry, Dr. Homer Hendrickson, President of the College board of trustees, announced on March 21.

According to Dr. Hendrickson the school's professional curriculum is already accredited by the Council on Education of the American Optometric Association and the new accreditation means that the college has now received acceptance of its curriculum on both a professional and academic basis.

Evaluation procedures necessary for accreditation by the Western College Association include a preliminary visit by representatives of the association, an extensive self-study and written report, a visit by a six man team of educators, and approval by the Association.

The initial period of accreditation is for three years.

A COMPARISON OF SCHIØTZ TONOMETER FINDINGS ON CORNEA AND SCLERA*

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In spite of the limitations of the impression tonometer in measuring the intraocular pressure, the Schiøtz tonometer remains a valuable and for the present the most widely used means of investigating the tension of eyes suspected of glaucoma. The Schiøtz tonometer was designed to be applied to the cornea and is properly designated a corneal tonometer.

Another impression tonometer designed by Wolfe for use on the sclera has recently received considerable attention and several studies[1,2,3,4] have compared its findings as to sensitivity, reliability, and clinical worth with those of the Schiøtz instrument. Results of two of these studies[2,4] show that, at least in the case of pig eyes, corneal tonometry is significantly more sensitive to changes in the intraocular pressure than is scleral tonometry. Furthermore, Cockburn[2] has shown that corneal tonometry using a Schiøtz tonometer is more accurate in detecting cases of glaucoma than is scleral tonometry. Another study by Hirsch[1] showed that the findings of the Wolfe instrument when used on human eyes gave a bimodal distribution unlike the unimodal distribution of corneal findings. Whether these differences are primarily due to differences in the instruments themselves or whether they arise because of differences in the tissues upon which the instruments are applied is a matter of some importance and one about which there is some differences of opinion. For instance, Carter[3] after studying the construction and calibration of these two tonometers suggests that the difference lies in the instruments, while Hogg and Alpern[4] stress the difference between the corneal and episcleral tissues.

EXPERIMENTAL PROCEDURES

In one of his experiments using pig eyes Cockburn[2] applied each instrument in turn, first to the cornea and then to the sclera. Pressure in the eye was then changed by a pressure system attached to the eye and another set of readings was made, and so on. From the results he

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concluded that not only was corneal tonometry more sensitive to changes in the intraocular pressure than was scleral tonometry, but that the Schiøtz tonometer was more sensitive than the Wolfe tonometer when applied to the sclera. This last finding indicated that further comparisons of the corneal and scleral findings using a Schiøtz tonometer might prove of interest and the following experiments were undertaken.

As in the previous studies enucleated pig eyes were used because of their availability and because of the similarity in their size and curvature to human eyes. However, one disadvantage in using enucleated eyes must be noted. In enucleated eyes, the thickness and the amount of stretch of the episcleral and conjunctival tissues are likely to be abnormal. It is obvious that in the enucleated eye, the episcleral tissue is not subject to the normal backward pull of the extraocular muscles to whose tendons it is attached. Furthermore, it is reasonable to assume that the natural elasticity of the conjunctival tissue will cause it to bunch and thicken anteriorally to its line of severance when enucleated. These two factors, since they affect the impressibility and resiliency of the superficial scleral tissues, might account for some of the differences that have been noted between corneal and scleral tonometry.

In an attempt to reduce these effects, tension was applied to the conjunctiva and episcleral tissues in the eyes used. This was done by passing a needle and thread through several points of these tissues so the thread formed a circular loop several millimeters anterior to the eye's equator. Tension on the loop was then supplied by additional threads connecting the loop to points on the posterior surface of the eye. In this way it was hoped that the circumstances of these tissues in the experimental eyes more or less approached those obtaining in the case of living eyes. In no case was the thread readjusted once the experimental findings on an eye were begun.

Also, in the case of the experimental eyes, the corneal curvatures were measured by use of a keratometer. These ranged from 8.9 mm. to 8.0 mm. and had a mean value of 8.6 mm. Such differences were not considered important in their effects upon the corneal tonometer readings.[5] Each eye was prepared for measurement as follows:

The anterior chamber was connected to an open end mercury manometer and reservoir through a #22 hypodermic needle and suitable lengths of polyetheline tubing. The system was filled with normal saline solution. Pressure in the eye was controlled by raising and lowering the reservoir to any desired level. In each case the needle was inserted into the anterior chamber of the eye through a point in the sclera near the corneoscleral junction. When in position its point rested just anterior

to the apex of the front surface of the lens. After insertion the needle was secured and a second keratometer reading was taken as a check against distortion of the corneal curvature.

The eye was mounted in a soft wax, spherical envelope that rested in a plaster mould which in turn was fixed to a horizontal beam. Rotation of the beam about its axis made it possible for alternate readings to be taken on the sclera and cornea while the plunger's axis remained vertical.

Periodic checks were made using a second Schiøtz instrument to ensure that the tonometer was operating properly. All readings were transposed to the 1955 standard calibration scale supplied with the instrument. Because the measurements were of the open stopcock type, the readings were taken immediately upon application of the tonometer to the eye. Intervals between successive measurements were sufficient to allow the intraocular pressure to recover the manometric level. A drop of saline solution was applied periodically to the cornea and sclera to prevent drying.

EXPERIMENT I.

The purpose of the first experiment was twofold:

(1) To determine the effects on scleral tonometry of tying the conjunctival and episcleral tissues to the back of the eye as described above and;

(2) To compare the reliability of corneal and scleral tonometry when using a Schiøtz tonometer (Sklar type) on enucleated pig eyes.

The manometer pressure was set at 25 mm. Hg. With the eye tied, one hundred alternate measurements were made on the cornea and sclera. The eye was then untied and an additional one hundred alternate measurements were made. The 7.5 gram plunger weight was used throughout. The experiment was repeated using a second eye, except that the first hundred readings were taken with the eye untied and the second hundred with the thread in place. The results for the first eye are shown in Figure 1 and Table 1 compares the tied with the untied measurements for both eyes.

Considering the data, there can be little doubt that the tension applied to the episcleral tissues has a decided effect upon the scleral measurements. On the other hand tying does not affect the corneal measurements. Evidently, in the case of the untied eye one cannot presume that just because the episcleral tissue is loose, it will necessarily show, as might be expected, a higher scleral than corneal reading. For in the case of Eye #1 the untied scleral findings are significantly

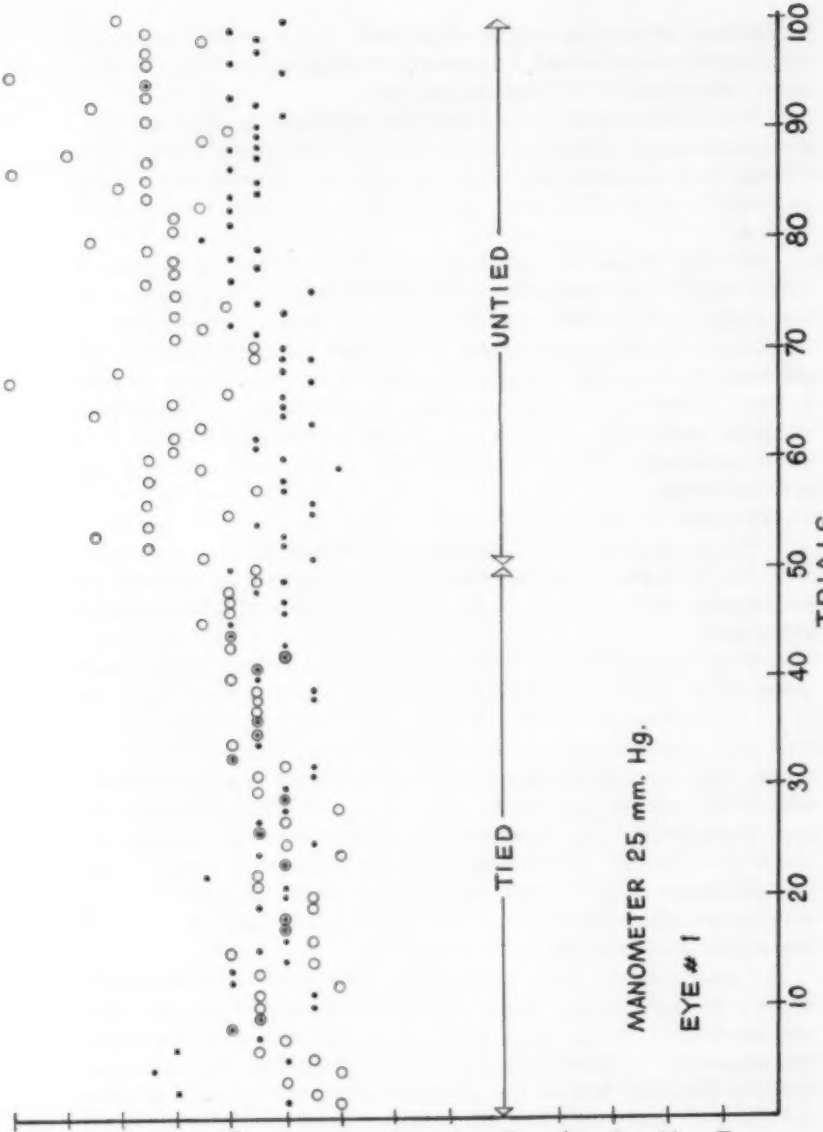

Fig. 1. Two hundred consecutive findings taken alternately on cornea (closed circles) and sclera (open circles) for one pig eye. The eye was tied for the first hundred trials and untied for the second hundred trials.

TABLE 1
100 CONSECUTIVE FINDINGS ON SCLERA AND CORNEA

Eye #1	First 50 Trials (Tied)		Last 50 Trials (Untied)	
	Cornea	Sclera	Cornea	Sclera
Average	9.4	9.3	9.4	11.3
Standard deviation	0.66	0.66	0.62	0.98
Average first 25 of 50 trials	9.5	9.0	9.0	11.0
Average last 25 of 50 trials	9.3	9.6	9.8	11.6
Eye #2	(Untied)		(Tied)	
Average	9.2	5.0	9.0	8.1
Standard deviation	0.93	1.03	0.68	0.79
Average first 25 of 50 trials	9.4	5.5	9.0	8.0
Average last 25 of 50 trials	9.1	4.6	9.0	8.2

more and in Eye #2 significantly less than are the corneal findings. Furthermore, tying results in good agreement between the scleral and corneal readings. As for reliability, first it is obvious that the findings on tied eyes show less deviation about the mean than is the case with untied eyes and secondly, that the reliability of scleral measurements taken on tied eyes is comparable to that of the corneal measurements. It should also be noted that the scleral measurements on untied eyes do not decrease appreciably with consecutive readings as did those of Hogg and Alpern[4] using a Wolfe tonometer. Reasons for this difference will be given later.

EXPERIMENT II

In a second experiment the sensitivity of the Schiøtz tonometer to variations in the intraocular pressure when applied to the sclera was compared with its sensitivity when applied to the cornea. In each of the nine pig eyes a series of intraocular pressures was induced ranging from 15 to 60 mm. Hg. For each pressure setting 10 alternate corneal and scleral readings were made, that is five for each. For pressures up to and including 30 mm. Hg., the 7.5 gram load was used. For pressures above 30 mm. Hg., the 10 gram load was used. All eyes were tied.

Averages of the corneal and scleral findings for each eye for each induced pressure were taken and the plots of the average measurements for all eyes are given in Figure 2. The slopes of the best fit lines found by the method of least squares are given in Table 2.

Figure 2 is remarkable for two reasons. First it shows, at least in the case of the mean findings, that the sensitivity of the scleral tonometry to changes in the intraocular pressure is not much different from that of corneal tonometry. Only at the upper and lower limits of the induced pressure range does there seem to be any appreciable divergence of the

TABLE 2
VARIATIONS IN SLOPES OF NINE PIG EYES

EYE	SLOPE		EYE	SLOPE	
	Cornea	Sclera		Cornea	Sclera
1	0.83	0.76	6	0.81	0.72
2	0.83	0.54 (0.71)	7	0.90	0.70
3	0.84	0.57 (0.80)	8	0.91	0.85
4	1.02	0.93	9	0.75	0.80
5	0.89	0.93			

results. Secondly, it might be noted that in the case of the lowest pressures, the sclera findings show a better correlation to the actual intraocular pressures. The opposite is true for the measurements made at 50 and 60 mm. Hg.

In previous studies[2, 4] it was shown that the slopes of the corneal and scleral findings varied from eye to eye. This was also found to be the case in this experiment. Here the slopes given in Table 2 indicate that while the corneal measurements show a somewhat higher sensitivity, it is only in the case of eyes 2, 3 and 7 that the scleral findings suffer much by comparison.

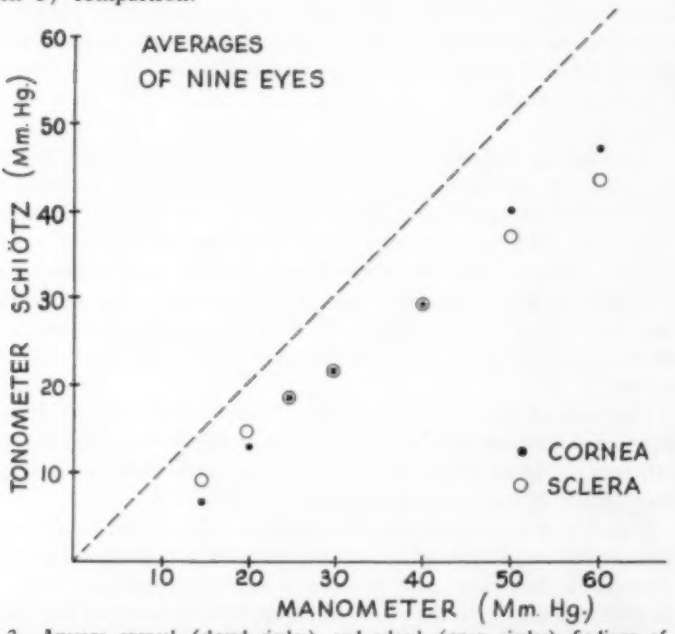

Fig. 2. Average corneal (closed circles) and scleral (open circles) findings of the Schiotz tonometer (7.5 gram load) taken on nine pig eyes at several levels of induced intraocular pressure. For individual slopes of the best-fit line see Table 2.

In these eyes we can only conclude that some property of the sclera is appreciably different from those of the corneas and scleras of the other eyes. It might be that the applied tension on the episcleral tissues of these two eyes was different than in the other eyes. However, it was noted that in plotting the individual data for eyes 2 and 3, the lower pressure findings, that is for induced pressures of below 50 mm. Hg., the slopes were similar to other eyes. Only the scleral measurements for pressures of 50 and 60 mm. Hg. were off line. When the best-fit lines were recalculated omitting these two extreme pressures, their slopes were found to be 0.71 and 0.80 respectively. Thus even in these cases, scleral tonometry showed a comparable sensitivity with corneal tonometry in the normal and critical pressure ranges.

EXPERIMENT III

A third experiment was carried out for the purpose of comparing the corneal and scleral findings of the Schiøtz tonometer on living human eyes. Readings were taken using the 5.5 and 10 gram loads on both the corneas and scleras of 81 eyes having an average age of 71.5 years. In approximately half the subjects the corneal measurements were taken first. In the remainder the order was reversed. The instrument was

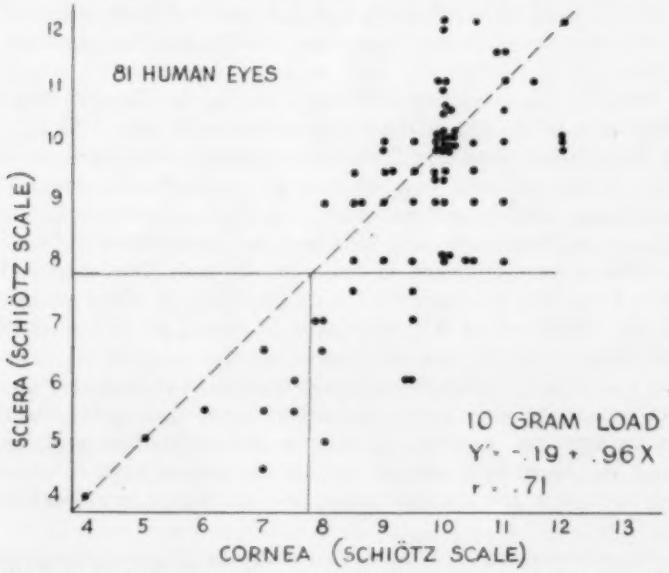

Fig. 3. Scattergram of scleral and corneal Schiotz tonometer findings using a 10 gram load taken on 81 living human eyes.

applied to the apex of the cornea and to an area in the superior temporal surface of the sclera about 1 mm. outside the corneoscleral junction. Care was taken to avoid placing the plunger on the insertions of the extraocular muscles. All measurements were taken with the subject lying on his back with the face plane horizontal. While it was found that it was not necessary to anaesthetize the anterior surface tissues of the eye in order to take the scleral measurements, nearly all corneal measurements need to be so taken. For convenience and so that both measurements could be made at approximately the same time, a drop of 0.5% pontocaine solution was instilled in the cul de sac a few minutes prior to the time of measurement. A scattergram of the 10 gram load measurements for cornea and sclera is shown in Figure 3.

Before attempting to analyse the scattergram in Figure 3, some attention should be paid to the measures of central tendency, range and the deviations of the two groups of findings. In the case of the 5.5 gram load, the findings for the cornea and sclera were respectively as follows: modes 5 and 5; means 4.6 and 4.4; ranges 7 and 7; and the standard deviations were 1.05 and 1.0 scale units. For the 10 gram load these were: modes 10 and 10; means 9.5 and 9.0; range 12 and 12, and standard deviations 1.3 and 1.6 scale units. The differences in nearly all cases being considerably less than one-half of one scale unit.

However, the correlation coefficient r relating the scleral and corneal measurements in the case of the 5.5 gram load was only 0.50 and the slope of the best-fit line only 0.55. The low slope value indicates that scleral tonometry would over refer in the sense that it gives lower scale readings (higher ocular tension) than corneal tonometry. This was found to be the case and 21 scleral as compared with 7 corneal measurements gave a reading of less than 3.5 scale units (more than 24 mm. Hg.). On this basis the clinical feasibility of scleral tonometry using the 5.5 gram load is questionable. However, in fairness to these scleral measurements it must be pointed out that in only one instance did an eye show a higher than normal tension when measured on the cornea and at the same time a normal or lower than normal tension when measured on the sclera. It may be that only scleral readings of 2.5 and less should be considered indicative of increased ocular tensions. If this were done, the over referrals in this case would be reduced from 14 to 5 eyes.

Inspection of Figure 3 shows that when the 10 gram plunger load is used, there is better agreement between the two sets of data. Here the slope of the best-fit line closely approaches the ideal (broken line):

the equation being $Y' = -0.19 + 0.96\ X$. Generally, there is a close agreement. The coefficient of correlation was found to be +0.71. Of most importance, it can be seen from the plot that all the eyes showing a corneal reading of 7.5 or less (ocular tensions of 25 mm. Hg. or more) show scleral readings of 7.5 or less (actually 6.5 or less). In no instance did scleral tonometry fail to select an eye which showed an increased ocular tension according to corneal tonometry. Again there is over referral compared with the corneal measurements, but not so much as with the 5.5 gram load. If corneal readings of 8.0 (ocular tensions of 23 mm. Hg.) are to be considered borderline, then over referral is limited to 5 cases in all.

This tendency for a small number of the scleral findings to over refer, that is, to show higher tensions than corneal tonometry, ties in with an observation made by Hirsch.[1] He found while using a Wolfe scleral tonometer on human eyes that the distribution of his measurements was bimodal; the second or minor peak showing just above the 30 mm. Hg. level. In the present study the 5.5 gram scleral distribution was also bimodal; the minor peak occurring at about the 25 mm. Hg. level. With the 10 gram load any bimodality of the distribution is less obvious. However, Figure 3 shows that a minor peak in the scleral findings is suggested in the range between the 5 and 6.5 measurements. The average value of these 10 findings is approximately 35 mm. Hg.

If this is so, it emphasizes the fact that in the case of some 10 per cent of the eyes measured in this way, there are appreciable differences in the impressibility of their scleras compared with their corneas and/or appreciable differences in their radii of curvature. This bimodality of the scleral distribution does not necessarily then, as Carter[3] suggests, reflects some artifact in the operation of the Wolfe tonometer.

CONCLUSIONS AND DISCUSSION

From the data of Experiment I it may be concluded that tying an eye, i.e., applying tension to the episcleral and conjunctival tissues, affects tonometry by reducing the chief differences between the corneal and scleral findings. And while it cannot be said with any certainty that the tied eye approximated the living eye more than did the untied eye, yet it seems reasonable that such was the case. Not only was the variability of consecutive measurements found to be better in the case of the tied eye, but it was found to be comparable with that of the consecutive corneal findings.

In this experiment no continual decrement of the scleral findings

on untied eyes during 50 consecutive trials was found. On the other hand the findings of Hogg and Alpern[3] using a Wolfe tonometer did show such a decrement. This would indicate that the Schiøtz scleral findings are more reliable than the Wolfe scleral findings and furthermore, that the decrement was due to factors inherent in the Wolfe tonometer used in their experiment, rather than to any property of the scleral tissues.

From the results of Experiment II it is concluded that in the case of tied pig eyes, the sensitivity of the Schiøtz tonometer used on the sclera compares quite satisfactorily with its sensitivity when used on the cornea. It was also obvious from the individual results that the sensitivity of the instrument whether applied to the cornea or to the sclera varied from eye to eye. The variations in sensitivity (changes in slope of the best-fit lines) were greatest in the scleral findings in most but not all findings. Even in the individual data there was fairly good agreement. It was not determined whether any of the individual variations in the scleral sensitivity depended upon the nonuniformity of the tensions applied to the episcleral tissues. However, since no fine control over this factor was undertaken, it is likely that some nonuniformtiy in this respect prevailed.

The conclusions drawn from Experiment III in the case of 81 living human eyes are:

(1) Scleral tonometry using the Schiøtz tonometer and the 5.5 gram plunger load does not show very good agreement with the corneal measurements using the 5.5 gram load. Because it showed 21 of 81 eyes to have ocular tensions in excess of 25 mm. Hg., when the corneal measurements showed this to be so in only 7 cases, it is likely that its clinical applicability is seriously limited. On the other hand, in almost every case it selects the same eyes as does corneal tonometry for having increased ocular tensions. In short, while it over refers, it does not under refer cases of increased ocular tension.

(2) Scleral tonometry using the Schiøtz tonometer with the 10 gram load shows much better agreement with corneal tonometry than with the 5.5 gram load. While it classifies a few more eyes as having increased ocular tensions than does corneal tonometry, the extent of such over referral is small; maybe 5 per cent of all cases. This, coupled with the fact that it selected all eyes, that the corneal measurement showed to have an elevated ocular tension, indicates that it may prove valuable for clinical use where corneal tonometry is not used.

(3) It is likely that the over referral using scleral measurements as compared to corneal measurements is associated with the bimodal

distributions of the scleral measurements. First, because the minor peak was found to fall within the elevated ocular tension range and second, because low over referral is associated with less apparent bimodality and vice versa. No mechanical, physiological or pathological basis for this bimodality of the scleral distributions seems evident from the data. It is concluded, however, that since the corneal distributions do not show a similar bimodality, the tissues rather than the Schiøtz tonometer itself are responsible.

Unfortunately at the present time no information is available concerning the incidence of glaucoma in the 81 eyes measured in the last experiment. Obviously such information is needed to help establish the clinical value of scleral tonometry when using the Schiøtz tonometer.

In this respect what is needed most in future studies is more data on more eyes. Particularly studies on human eyes are needed and particularly studies like that of Cockburn[2] in which measurements on control and glaucomatous groups were made. Also helpful would be a comparison of the findings of an applanation tonometer and the Schiøtz tonometer.

SUMMARY

When the episcleral tissues of two pig eyes were fastened under tension to the back of the eyes (tied eyes), the corneal and scleral findings of a standard Schiøtz tonometer showed good agreement in terms of their magnitude and variability.

Similar measurements on nine pig eyes in which the intraocular pressures were controlled by means of a manometer showed that the sensitivity of the scleral findings while less, were not considerably less, than were the corneal findings.

In 81 living human eyes it was found that scleral tonometry (Schiøtz) was highly effective in selecting eyes with increased ocular tension as measured by corneal tonometry.

Some over referral of scleral tonometry was related to the bimodality of the scleral distributions.

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ANNOUNCEMENT

PUBLICATION DESCRIBES B & L THORPE SLIT LAMP

The growing importance of biomicroscopy for pathological diagnoses as well as successful contact lens fitting has prompted Bausch & Lomb to publish a comprehensive new brochure on the Thorpe Slit Lamp. It is fully documented with diagrams and photos providing a thorough description of an instrument which combines maximum precision with simplified operation.

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A ROUTINE FOR EXAMINATION OF CONTACT LENS PATIENTS*

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St. Louis, Missouri
and
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Moberly, Missouri

THE NEED FOR ROUTINE EXAMINATION

In the general practice of optometry, each practitioner has established a definite routine of objective and subjective tests of visual performance and refraction. Through analysis of data obtained from these tests, he evaluates visual difficulties and records information for future consideration. The authors believe that the same type of routine examination should be established for fitting contact lenses.

The idea of systematic testing is not new. Lester,[1] Goodlaw,[2] and others have suggested such a routine—especially in the area of biomicroscopy. Confusion and disagreement, however, which occur frequently in the literature, have made the application difficult. Many comprehensive methods have been recommended, but no real attempt has been made to apply such a routine, to state general principles, and to establish order in the field.

The controversy and dynamic swirl of ideas in themselves constitute a healthy situation. They suggest future growth of a field that is alive and growing. Nevertheless, optometry can not afford to postpone adopting some regimentation of thought. General principles, methods of testing, approaches—all must be standardized as a foundation for future growth. There are principles and tests now existing which are common to all philosophies. At least one aspect of this stabilization—*the introduction of a routine contact lens examination*—should be established immediately. A basic outline and arrangement of procedures should be made now. It may be expanded as further knowledge is attained. It is to this end that this paper is presented.

There are four reasons for establishing such a routine: 1. Without order, essential findings may be inadvertently omitted. 2. Essential findings may be omitted as "non-essential," only to be needed for

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comparisons at some later date. The example of keratometer findings is most frequently cited. 3. Progress examinations may be poorly timed, inefficient and haphazard, creating an economic and physical hardship on both patient and practitioner. 4. The period of initial fitting may never be brought to a satisfactory conclusion—the patient returning for months, or years, for subsequent service without proper fees.

An optometrist is human. Under the pressure of an active practice, he may omit some necessary measurement. If that measurement or observation is essential to the prescription, he must submit to the embarrassment of requesting the patient's return. If it is a test or observation which may be required for comparison with a similar test later in the care of the patient which is omitted, it is lost forever.

As the practitioner's contact lens practice increases, if a definite routine of examination is not established, he may relegate more and more information to memory, possibly "dropping out" part of his original meticulous and cautious examination. He probably realizes that many of his original procedures were not required, but based on his own timidity. From the practical point of view, he is doing a better job, bringing about quicker adaptation and satisfying his patients to a greater degree. He has learned how to fit contact lenses. However, the application and timing of procedures may have become confused and are being introduced in a meaningless manner. At times records may be devoid in information. The situation eventually results in more frequent repeat visits by the patient, application of tests at inopportune times, and a confusion regarding wearing schedule and adaptation period. Confusion may reach the degree wherein it becomes apparent to the patient that the doctor is making tests more at their direction than as part of an established routine. Furthermore, although contact lens care itself is perpetual, a system must be followed to bring to a conclusion the "initial care" phase. A definite termination of such initial care must be indicated to assure an economic basis for subsequent care.

The fitting of contact lenses has mushroomed. There are a multitude of levels in the skill with which it is applied. Optometrists fitting one or two lenses a year, one or two a month, or that many in a day, have decidedly different problems. Nevertheless, the time to develop a routine examination is early in the career of contact lens fitting. Otherwise, the optometrist inadvertently builds an economic monster significantly more difficult to manage than the simple establishment of the systematic approach.

It should be optometry's goal in the adopting of such a method of examination to eventually apply syndromic analysis for predetermining wearability, and for proper interpretation of symptoms and signs. A definite order and procedure for tests and observations would be required, and must be part of the design.

The routine must also be correct and simple. When firmly established in the habits of the practitioner, it should serve as a foundation on which to build. It must be adaptable for various situations. Progress examinations—an important phase of contact lens care—must include certain procedures applied with consistency.

Yet, an involved examination would prove too time consuming and unnecessary. This would be unfair to both patient and doctor. Variations in the routine, therefore, are recommended for common situations encountered. It is the authors' recommmendation that practitioners adopt the order presented for introducing procedures, and that in the future the method of application for each procedure be outlined. As greater and advanced knowledge becomes available, each new procedure should be introduced in its appropriate place in the routine. Each year the routine and procedure should be reevaluated and expanded as required.

DESIGNING THE ROUTINE

This paper attempts to establish a framework for routine examination. It includes procedures which should be used on all patients either for initial fitting or future comparison. Although the findings are secured in a different manner by each practitioner, they are considered essential by the majority. Full description of the tests is not included. More research will be necessary to complete such work. We deal here only with the procedures in general, and with a practical arrangement regarding order. Instrumentation and other pertinent factors (i.e., excessive lacrimation occuring during some types of examinations) have been given consideration.

There are certain attributes which should be part of the routine design: 1. *Necessity*. All procedures that are of value in assisting the doctor to evaluate better the case should be included. Yet, tests should not be introduced for the sake of the examination rather than the patient's need. 2. *Simplicity*. The basic routine should be as simple as possible, providing only the framework for future building. The basic steps in the routine must not be those which require a multitude of subtle observations made simultaneously. The tests should be made; the interpretation should be left to the insight and experience of the practitioner. As our knowledge increases and observations are linked

scientifically to certain conditions, the routine may be expanded. Complicated procedures involving many observations should be subdivided. 3. *Informative.* The routine must provide sufficient information to care satisfactorily for the patient initially and for later comparison. 4. *Practicality.* The basic routine must include only those tests which may be performed with equipment found in the average optometrist's office. Tests and procedures should also be arranged in an optimum order from the viewpoint of practicality. 5. *Flexibility.* The system should be sufficiently flexible to take into account all types of examinations, and to be such that additional tests may be added as greater knowledge is attained.

THE ROUTINE

Perhaps the recommended system for designating findings in the routine will seem to lack imagination. Nevertheless, the authors believe that the simple numerical arrangement of findings is best suited for the classification desired. As indicated above, placement of findings is based on either instrumentation or type of tests. Associated findings have been classified alphabetically. As tests are added in the future, each test will be placed numerically in its proper position using the numeral preceding it followed by a decimal point and the number appropriate to its position (i.e., If a test were to be added later between test No. 1 and test No. 2, and if the new test were not logically associated with either, it would become test No. 1A, 1B, 1C, or whatever letter was next available in the No. 1 series.)

Definite planning should be associated with the routine to bring the period of initial care to its conclusion. If such steps are not taken, the optometrist may discover that his contact lens patients are returning for rather pointless, or at least poorly timed, progress examinations, and the period of initial fitting becomes one of perpetual care without charge.

After the patient has achieved all day wearing, he should be seen at one week, two week, one month, two month, four month, and finally six month intervals. When the six month interval has been achieved, the period of initial fitting should be considered complete. The patient should then be seen at six month intervals for as long as contact lenses are worn. None of the increases in the period between visits indicated above should be introduced until all detrimental signs and symptoms associated with the preceding interval have been eliminated. Progress examinations should be considered a search for difficulties resulting from increased wear. Variations in the basic routine for each progress examination during each of these periods have been indicated. The com-

plete routine should be utilized for initial fitting prior to ordering contact lenses if trial lenses are employed. Following initial fitting of the patient's lenses, the first three findings will be omitted.

It might also be noted that the authors have assumed that in active contact lens practice, the progress examinations of the patient follow a definite format: (1) the patient's statement (2) the routine examination (3) adjustment of lenses (4) re-evaluation following adjustment (5) dismissal of the patient with the outlining of directions for wear and next examination.

In presenting the routine examination and its variations, the authors beg the understanding of the practitioner. Obviously, argument might be advanced for the inclusion or omission of many of the points. However, the authors would submit only the classification of the basic routine for standardization. It is their hope that the optometrist interested in promoting such a plan maintain the order and sequence of findings even though they omit certain tests. They believe that the meaning of the various points are obvious and arranged in a practical order. Detailed description is to be reserved for a later paper, and at a time when more agreement exists in the field.

BASIC ROUTINE

1	Ophthalmometry
2A	Internal biomicroscopy
2B	External biomicroscopy
3	Anatomical measurements
4A	Visual acuity through contact lenses
4B	Retinoscopy through contact lenses
4C	Subjective through contact lenses
5A	White light objective without manipulation
5B	White light objective with manipulation
5C	White light subjective with manipulation
6A	Biomicroscopic examination of position without fluorescein
6B	Biomicroscopic evaluation of motion without fluorescein
6C	Biomicroscopic evaluation of tear flow without fluorescein
7A	Biomicroscopic evaluation of corneal integrity
7B	Biomicroscopic examination for corneal edema
7C	Biomicroscopic evaluation of tear flow with fluorescein
7D	Biomicroscopic evaluation of physical fit
7E	Biomicroscopic examination of sclera
8A	Black light evaluation of corneal integrity
8B	Black light evaluation of physical fit without manipulation
8C	Black light evaluation of physical fit with manipulation
9	Black light photography
10A	Ophthalmometry with contact lenses in position
10B	Ophthalmometry with contact lenses removed

PERIODIC EXAMINATION DURING FIRST DAY WEAR

4A	Visual acuity through contact lenses
5A	White light objective without manipulation
5B	White light objective with manipulation
8A	Black light evaluation of corneal integrity
8B	Black light evaluation of physical fit without manipulation
8C	Black light evaluation of physical fit with manipulation

FINAL EXAMINATION FOLLOWING FIRST DAY WEAR

4A Visual acuity through contact lenses
4B Retinoscopy through contact lenses
5A White light objective without manipulation
5B White light objective with manipulation
5C White light subjective with manipulation
6A Biomicroscopic examination of position without fluorescein
6B Biomicroscopic evaluation of motion without fluorescein
6C Biomicroscopic evaluation of tear flow without fluorescein
7A Biomicroscopic evaluation of corneal integrity
7B Biomicroscopic examination for corneal edema
7C Biomicroscopic evaluation of tear flow with fluorescein
7D Biomicroscopic evaluation of physical fit
7E Biomicroscopic examination of sclera
8A Black light evaluation of corneal integrity
8B Black light evaluation of physical fit without manipulation
8C Black light evaluation of physical fit with manipulation
9 Black light photography
10A Ophthalmometry with contact lenses in position
10B Ophthalmometry with contact lenses removed

PROGRESS EXAMINATION DURING BUILDING OF WEARING TIME

4A Visual acuity through contact lenses
5A White light objective without manipulation
5B White light objective with manipulation
5C White light subjective with manipulation
6A Biomicroscopic examination of position without fluorescein
6B Biomicroscopic evaluation of motion without fluorescein
6C Biomicroscopic evaluation of tear flow without fluorescein
7A Biomicroscopic evaluation of corneal integrity
7B Biomiscroscopic examination for corneal edema
7C Biomicroscopic evaluation of tear flow with fluorescein
7D Biomicroscopic evaluation of physical fit
7E Biomicroscopic examination of sclera
8B Black light evaluation of physical fit without manipulation
8C Black light evaluation of physical fit with manipulation

PROGRESS EXAMINATION FOLLOWING THE ACHIEVING OF ALL DAY WEARING

4A Visual acuity through contact lenses
4C Subjective through contact lenses
5A White light objective without manipulation
5B White light objective with manipulation
6A Biomicroscopic examination of position without fluorescein
6B Biomicroscopic evaluation of motion without fluorescein
6C Biomicroscopic evaluation of tear flow without fluorescein
7A Biomicroscopic evaluation of corneal integrity
7B Biomicroscopic examination for corneal edema
7C Biomicroscopic evaluation of tear flow with fluorescein
7D Biomicroscopic evaluation of physical fit
7E Biomicroscopic examination of sclera
9 Black light photography
10A Ophthalmometry with contact lenses in position
10B Ophthalmometry with contact lenses removed

PROGRESS EXAMINATION DURING SIX MONTHS FOLLOWING ACHIEVING OF ALL DAY WEARING

4A Visual acuity through contact lenses
4C Subjective through contact lenses
5A White light objective without manipulation
5B White light objective with manipulation
6A Biomicroscopic examination of position without fluorescein

6B Biomicroscopic evaluation of motion without fluorescein
6C Biomicroscopic evaluation of tear flow without fluorescein
7A Biomicroscopic evaluation of corneal integrity
7B Biomicroscopic examination for corneal edema
7C Biomicroscopic evaluation of tear flow with fluorescein
7D Biomicroscopic evaluation of physical fit
7E Biomicroscopic examination of sclera
10B Ophthalmometry with contact lens removed

PROGRESS EXAMINATION OF ADAPTED WEARERS AT SIX MONTH INTERVAL

4A Visual acuity through contact lenses
4C Subjective through contact lenses
5A White light objective without manipulation
5B White light objective with manipulation
5C White light subjective with manipulation
6A Biomicroscopic examination of position without fluorescein
6B Biomicroscopic evaluation of motion without fluorescein
6C Biomicroscopic evaluation of tear flow without fluorescein
7A Biomicroscopic evaluation of corneal integrity
7B Biomicroscopic examination for corneal edema
7C Biomicroscopic evaluation of tear flow with fluorescein
7D Biomicroscopic evaluation of physical fit
7E Biomicroscopic examination of sclera
9 Black light photography
10B Ophthalmometry with contact lenses removed

EQUIPMENT

To accomplish the routine as outlined above, basic equipment for fitting and observation of the patient is required. If possible, it should be installed in a room other than that used for refracting. The authors are not referring to the so-called "crying room" which is an institution of a bygone age. Public relations demands that after initial insertion the patient be seated comfortably in the reception room or anywhere *without tears*. However, a separate room should be available for insertion, observation and checking. In many instances, the practitioner may require little time for observation of his contact lens patients, and may momentarily excuse himself from a patient elsewhere in his office.

The following equipment should be available in the contact lens room:

1. Acuity chart.
2. Retinoscope.
3. Trial frame and spectacle trial case.
4. Biomicroscope.
5. Black light illumination with magnifier.
6. Camera and equipment for black light photography.
7. Instrument for ophthalmometry.
8. Running water.

At times a practitioner may have elaborate equipment throughout his office, especially in the refracting room, and yet have pitifully poor

VARIATION IN ROUTINE FOR DIFFERING SITUATIONS

	1	2A	2B	3	4A	4B	4C	5A	5B	5C	6A	6B	6C	7A	7B	7C	7D	7E	8A	8B	8C	9	10A	10B
Basic Routine	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Periodic examination during first day wear					X			X	X										X	X	X			
Final examination following first day wear					X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Progress examination during building of wearing time					X			X	X	X	X	X	X	X	X	X	X	X		X	X			
Progress examination following the achieving of all day wearing					X		X	X	X		X	X	X	X	X	X	X	X				X	X	X
Progress examination during six months following the achieving of all day wearing					X		X	X	X		X	X	X	X	X	X	X	X						X
Progress examination of adapted wearers at six month intervals					X		X	X	X	X	X	X	X	X	X	X	X	X				X		X

equipment in his contact lens room wherein he conducts his contact lens progress examination. Inasmuch as the optometrist's budget may not permit the duplication of equipment, it is recommended that the biomicroscope and an instrument for ophthalmometry be placed in the refracting room but that minor equipment such as acuity charts, trial case and retinoscope be available in both.

Although it is beyond the scope of this paper, it is the authors' thinking that the contact lens practitioner should adjust his own lenses, and that adjusting equipment be convenient to the contact lens room. Furthermore, they cannot over-emphasize the value of the biomicroscope in preliminary screening and observation of the lens on the patient. This tool for the determination of pressure areas, position and of motion of lens, tear flow, trauma to cornea and adjacent area, and for the checking of the lens itself is invaluable. Moreover, black light photography, which is relatively inexpensive, undoubtedly will play a permanent role in the record of the patient as it enters into more popular usage. The use of both instruments for the doctor's protection in the event of legal action is strongly recommended.

A PROJECT FOR OPTOMETRY

Post-graduate education, research and experience may call for modifications in the routine presented: but the system is flexible. The basic routine may be expanded and is quite usable with modification. What is learned today by rote need not be relearned at a late date. The pattern of tests must be relegated almost to the practitioner's subconscious, freeing his mental capacities for proper evaluation of information discovered. Eventually, syndromes may assist him in this evaluation.

Too many slit lamps and other equipment are not being used. To develop a facility with the biomicroscope, it should be used on all patients—not just the candidates for contact lenses. The optometrist must consider use of the biomicroscope part of his routine examination of *all* patients. The keratometer or ophthalmometer, if for no other reason, should be used for a comparison of corneal curvatures for the detection of keratoconus as suggested by Warren[3] and to predict the progression of myopia as suggested by Morrison.[4]

The authors recommend that optometrists adopt the tests as numbered and that they asist in the expanding of the routine. Correspondence is welcome. They would point out that any new procedures suggested should be accompanied by:

1. Descriptive name.

2. Description of the procedure.
3. Reasons for inclusion in the routine.
4. Recommended position for placement in the routine with reason.

SUMMARY AND CONCLUSIONS

The authors have endeavored to show the need for the establishment of routine examination in the fitting of contact lenses, advancing the arguments that essential findings required for initial fitting or for future comparison might otherwise be missed, to increase the efficiency of progress examinations, and to bring the period of initial adaptation to a definite conclusion. They have advanced the described method to be followed in designing such a routine, outlining certain attributes for the design and suggesting a simple numbering system. A basic routine with findings arranged in the order of practicality has been recommended, and variations to meet the differing circumstances of progress examinations have been included. Comment has been made on the spacing of progress examinations, other factors in the progress examination, the contact lens room and instrumentation, and optometry's role in contributing to such a program.

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VISON CARE PLANS AND THE AGING

Vision care of the aging patient has always been of prime concern to the optometrist. Increased interest has been evident in this field within the last few years because of the rapidly increasing number of senior citizens. The White House Conference on Aging has helped further to focus attention on this increasingly important part of optometry.

Within recent years there has been a tendency both on the part of private industry and government to explore further prepaid health plans which might include vision care. The Academy has a vital concern in this issue. Any prepayment of health care which would result in a lowering of standards of vision care of the aging patient must be vigorously opposed by all segments of optometry. There are certain fundamental issues involved in vision care which must be considered before any prepaid plan can be put into operation.

At a recent meeting of the California Optometric Association, Dr.

Monroe Hirsch of Ojai, California, presented the paper which appears in this issue on *Optometry and the Aging Patient*. This presentation emphasizes some major needs as they apply to vision care. What are the needs of the senior citizen which distinguish them from other segments of our population? As Dr. Hirsch so ably mentions in his presentation, the older patient needs time and understanding. Excellence in technique of examination is necessary at any age. It is just as necessary in the older age group. Time and understanding even above and beyond the average patient must be given to the older person if results are to be optimal. This can not be done in a hurried up atmosphere of competitive inadequate eye examinations.

The second point of optometric care which distinguishes it from other forms of health service is the low cost involved. The exception to this is the rare patient requiring microscopic spectacles. These people are already provided for in most States by Aid to the Blind. The *average* cost of vision care per person then is relatively inexpensive. This is an item which could be easily budgeted by the majority of senior citizens.

The government or private organization should not look for cut rate plans to care for one of the most precious possessions the aged patient has—his vision. The possibility of serious eye disease increases with age. Only the most thorough professional eye examinations available should be considered for this group.

Another major point to be considered in any health care plans concerning older citizens is regularity of need of vision care. Adequate vision care calls for an examination at intervals of every two years. Lens changes occur with fair regularity at intervals of every two years to four years. This applies to most all people over the age of 50. This is a necessary item like food or clothing, and like food and clothing it can be adequate or inadequate depending upon the person's willingness and ability to take care of these items. Because of the universal need and inexpensive nature of visual care it occupies a different position than catastrophic medical illness which is extremely expensive in the aged group.

It must be realized that most groups desiring to purchase prepaid health care for its members are looking for some kind of a bargain. Otherwise there is no particular value in paying in advance for this service. Where, then, does the bargain possibility occur in prepaid vision health care? This is extremely difficult to answer when we consider the items just mentioned, namely, time and interest are particularly necessary for all patients in the older age groups: regular vision care as encountered

in the optometric office is not of a catastrophic nature as far as costs are concerned; all older people are in need of regular periodic eye care. Perhaps the best "bargain" organized optometry has to offer is the very nature of the profession itself. Optometry is practiced in all size communities so that its services are available most anywhere. Traditionally we are accustomed to taking care of the vision needs of the aging and are willing to give the time and interest necessary to do a complete job. The impersonal nature inherent in many clinic type practices is rarely found in optometry.

What, then, should be organized optometry's goal for the future in health care plans and what specific interest does the Academy have in this program? Let us emphasize that there is a certain segment of the American population who can not afford vision care. This group has always existed to some degree and will have to be taken care of by society. Improvements can and should be made in most states in the care of the vision of these needy folks. This group, however, is a very small segment of our American economy. We are talking here of the largest majority of our aging citizens. Organized optometry will soon be called upon to negotiate for prepaid health services for certain senior citizens groups. The Academy and organized optometry can accept nothing but adequate vision care for the senior citizen. This means time and interest even above and beyond the average patient in the office. The older age group needs this and is certainly entitled to it. There can be no "discount" on the basis of running through any number of these patients at a faster rate. This is rank commercialism regardless of what type of office conducts it. The only savings which can be realized in group purchases are in materials and possibly in one central agency to collect all the bills for the doctor. If any compromise has to be made, it must be made in those areas and not in the type of professional services rendered.

Any long range government program intending to supply vision care should realize that it is supplying a service needed by all older people, an inexpensive service which is required at regular intervals the same as the other necessities of life. We can modify or put off some of these necessities, but the need is still present.

The final decision as to how vision care should be handled for interested senior groups and the Federal Government is up to the individual optometrist and his professional organizations. Let us hope, though, that we do not compromise with the basic vision needs of these people which form such a large part of our professional practices.

RALPH E. WICK

SPECIAL REPORT

SUGGESTIONS FOR INTERNATIONAL CO-OPERATION IN THE FIELD OF OPTOMETRY*

C. S. Flick†
London, England

The historian of the optical profession in the postwar years will notice several distinct and separate directions in which outstanding progress has been made.

By the aid of infinity balance techniques, red/green tests, and polarisation methods we have steadily improved our ability to measure and correct the refractive error of each eye under conditions of simultaneous binocular fixation.

In measuring and prescribing for near vision, intelligent precision methods have replaced rule-of-thumb empiricism.

In little more than a decade contact lenses have improved from the stage of interesting, potentially useful, experimental devices to being the normal everyday and all-day vision aids of millions of ametropes throughout the world.

Through the joint efforts of the optical industry in frame design and publicity such as the "Besser Sehen—Besser Aussehen" campaign** there has been a revolution in the attitude of the general public towards spectacle wearing. From being badges of infirmity or senility spectacles have become acceptable fashion accessories holding before the wearer's eyes whatever lenses are necessary to give him maximum visual efficiency.

If these and other similar trends are analysed it will generally be found that progress has been most marked where there has been international co-operation.

In the world today international tensions are constantly fluctuat-

*English version of the paper "Vorschläge für die internationale Zusammenarbeit auf dem Gebiete der Optometrie," read at the Berlin Optometric Congress, September, 1960. Submitted on December 28, 1960, for publication in the April, 1961, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.

The author's choice of words and British spelling have been retained throughout this paper. One change only was made by the editors in order to avoid confusion. The author's word "optician" has been changed to "optometrist" throughout. The counterpart of the American optometrist in England and in some Continental European countries is the refracting or opthalmic optician, usually referred to simply as the optician.

†Optometrist, B.Sc. President, British Optical Association. Fellow, American Academy of Optometry.

**A German public relations campaign similar to the BVI program in the United States.

ing; friendships wax and wane; the confidence of one nation in another strengthens and weakens almost from month to month. In the realm of optometry and ophthalmic optics it is gratifying to notice, however, that contacts between colleagues in one country and another are comparatively immune from the winds that blow hot and cold in politics.

In the postwar years there has been a steady growth in international co-operation in optometry and eyecare in general.

In the optical industry, too, the striving after national self-sufficiency, which is inevitable during wartime, has been replaced by a tendency towards importing and exporting, and the people of each country have an opportunity of sharing in the best that is available. There has been a general interchange of news, opinions, techniques, instruments, spectacle frames, lenses, and other optical products.

There has been more travel between one country and another on optical and optometric affairs than ever before. Congresses such as the ones of the DGO and WVA in Germany and others in London, Dublin, Paris, Bern, Amsterdam, Brussels, Madrid have taken on an international aspect because of the many representatives and delegates from other lands. The International Optical League, the Northern Optical Council of the three Scandinavian countries and Finland, the International Congress of Contact Lens Specialists, and now in these recent months GOMAC, have assured some permanence for these beneficial trends. But let us not rest on our laurels; much remains to be done; there still remain some old prejudices and barriers to be broken down; in some cases political or ideological differences still prevent free communication between the optometric colleagues of one country and another.

Being convinced in my own mind that further progress can best be made on an international front I venture to put before this congress a few suggestions.

EDUCATION

In the paper which I read at the International Optical Congress in Madrid earlier this year, when speaking of our scientific, technical and professional advancement by means of progressive legislation, I said that the master-key which unlocks more doors than any other is international optometric education. This subject alone could occupy the whole of the time of this report. We could discuss full-time and part-time courses; courses in special branches of our work such as contact lenses, pleoptics, orthoptics, aids for the partially-sighted; elementary workshop training; advanced optometry; refresher courses

for established practitioners who have omitted to keep up to date with modern techniques. Into these and other details time does not permit us to go, but I do maintain that in much, if not all, of such work international collaboration can help—particularly, of course, does it help countries in which progress in optometry has been retarded. A big responsibility rests on the shoulders of countries such as Great Britain, Germany and the United States of America, which are in the forefront of optometric progress, to help less advanced countries. A little has been done in this direction but not enough.

Herr Abel* has been asked by the International Optical League to go into the question of a common minimum training syllabus. After that has been approved we must try to help the optometrically backward countries to raise their standards to that common minimum. If necessary we must train some of their most promising young students in our own optical schools to form a nucleus in their own countries from which further progress can develop. Students who have trained up to the level of that common minimum could be granted a certificate which would have international validity. At first the standard would not be high, but at least it would exclude all the obviously incompetent, and could be progressively raised.

For some ten years the Northern Optical Council has had such a certificate successfully in operation in respect of apprentice training common to Denmark, Sweden, Norway and Finland. The idea deserves wider application. Students from many different countries regularly attend the Fachschule für Augenoptiker in Cologne. If I refer also to the London Course of Optometry I do so not by way of advertisement but because I am better acquainted with it than with other forms of tuition. Its steady growth since it was founded towards the end of 1956, the fact that students have attended from 21 different countries, and this year for example there were 28 from 16 different countries, are clear evidence to us that this kind of thing meets a real need.

A successful "Auswahlkurs" of the London Course of Optometry was held in Munich last March, organized by that enterprising optical educator Willi Kaue. Negotiations for another to take place in Leipzig at the end of October have broken down solely because of financial problems in the DDR, not any reluctance on the part of the local opticians or the British teachers. Mr. Freeman and I have been invited to conduct courses in British methods of optometry in Japan and Ceylon

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next year in addition to the one month in London. I repeat that I am not using this rostrum as a means of obtaining publicity for the London Course of Optometry but merely to recount one example of how international co-operation in the field of optometric education is being sought and found. It should be still further extended.

One particular direction in which more should be done is in teaching optometrists to better recognise ocular abnormality and disease in order that pathological cases can be promptly referred for medical or surgical treatment. There are still unfortunately some countries where such instruction is not available to optometrists who refract. Those of us who are further advanced in that field should be enabled to instruct them. I say "enabled" and that brings me to the question of the cost involved. Money is required to establish and run such courses. Many of the students who would benefit from this education are young people who require financial assistance in the form of bursaries, scholarships, and grants to enable them to travel in other countries, and widen their knowledge. Perhaps there are wealthy men and organisations in the optical profession and industry who would respond with practical assistance if the need were made known to them.

A welcome trend in recent years has been the increase in the number of study trips paid by parties of students. Thus a party from Cologne optical school visited London; a return visit of students from the Northampton College, London recently took place: Dutch and Scandinavian students have visited German factories: a coachload of young people from the Madrid school of optics went to Paris this summer. The more of this kind of thing that takes place the better for international optometry. I think students should be encouraged to attend optical congresses as part of their training; any who come to the International Congress, in London next July will be just as welcome as their seniors.

CONGRESSES

Mention of congresses brings to mind a few suggestions under that heading. Some people, and they are found in all countries, say we have too many of these. I do not agree. I think the oftener we have the chance of meeting our colleagues from other parts of our own country and from abroad the better. Naturally one cannot expect a busy optometrist to attend more than one or two such gatherings in a year, but there should be sufficient opportunities provided for everyone to attend at least one congress each year within reasonable reach of his own home. At the present time there are. Does every optometrist attend one or more? No. There should be better publicity for these events. I hasten

to add that the advance publicity for the DGO and WVA congresses within Germany is excellent but more could be done to make them more international in their scope. The official international congresses which meet from time to time, generally at 2-yearly intervals, have not in most cases been publicised widely enough or early enough. Also there should be more liaison between the organisers of these events in the early stages to avoid clashing of dates, as happened this year for example between the WVA Congress at Garmisch-Partenkirchen and the Scottish Conference, between this Congress and one in Northern Ireland (here the responsibility rests with the Irish people because your dates were announced a year ago), and between the congress in Israel and a series of three contact lens congresses in the USA in November. Having decided to hold a congress, particularly one in which foreign participation is invited, the dates should be firmly fixed and announced on a world-wide scale at least twelve months in advance.

The type of programme which the DGO has evolved for these annual congresses seems to me to be an admirable blend of technical, scientific, clinical and social events. I would commend to other countries the practice adopted in Berlin of holding at the same time as the main congress, meetings of allied interest such as the session on contact lenses yesterday afternoon. The International Congress in London next year will be followed immediately by a symposium on the teaching of ophthalmic optics. Thus those who spend time and money coming to the congress gain added benefit from their attendance.

INTERNATIONAI OPTICAL LEAGUE

For many years past, at one or other of the congresses in Great Britain or on the Continent of Europe, there have been meetings of the International Optical League. It will be Germany's turn again in 1962. The question of the past history, present activities, future aims, successes and failures of the I.O.L. is too big to go into in any detail here. It will be the theme of the I.O.L. president, Mr. G. H. Giles, in his paper at the conference in Israel in November. May I affirm here that I am a believer in the essential soundness of the conception of the I.O.L. It has brought together many of the leaders of the profession in different lands who might otherwise have had little or no contact. It has resolved many differences of opinion, and where that has not been possible it has enabled colleagues to agree to differ. It has set an example and given practical help in many instances where professional progress was slow or hampered.

But enough of the past. What of suggestions for the future? The recent admission of the American Optometric Association to the

League brings in the only remaining large country with a well-developed optometric profession. Efforts should now be made by direct invitation to bring in all other countries, however small and optometrically backward, in which there is any kind of cohesion between local optometrists and an association which is capable of accepting responsibility and providing representation. More use should be made of the latest clause to be added to the constitution throwing open associate membership of the I.O.L. to organisations in which the opticians do not at present carry out refraction. Membership of the League, even in a junior capacity, could give them a powerful impetus to further professional development towards optometry.

LECTURE TOURS

Such countries and organisations should receive visits from representatives of more advanced countries who could give them lectures and advice on professional development, optometric training, how to obtain the co-operation of their governments, and other matters which will enable them through our experience and example to make more rapid progress than we did.

One is always hearing of well-known figures in the optical world going hither and thither giving lectures. Sometimes these are well planned and coordinated to provide the maximum coverage on the tour, such as the recent round-the-world trip of Drs. Jessen and Cepero, Mr. Giles' Commonwealth tour, or the two visits Mr. Freeman has made to America. In other cases planning has been less organised and opportunities of making useful and helpful contacts have been missed.

No survey of international optometric co-operation can be realistic unless it takes account of the fact that at present the so-called Iron Curtain has created a barrier. Of the political and ideological reasons for this I say nothing, except that it is to be deeply regretted if these differences deprive anyone anywhere of the best that is available in the way of eyecare. I am wondering if the difficulties of communication have not been exaggerated a bit in the West. My own visits to East Berlin, Leipzig and Jena in the past few years, frequent correspondence with individual optometrists in the Eastern bloc, the presence of students from Poland and Yugoslavia at the London Course of Optometry in the last two years, the contingents of optometrists from the DDR at this congress each year, are all evidence that the barrier between East and West, although formidable, is by no means insurmountable. If travel permits, exchange restrictions, and similar difficulties confront our colleagues from the East we should assist them by all means in our power to get the authorities to unbend; and in the meantime we

should not hesitate to go into those countries ourselves with news of the latest developments in optometric knowledge, techniques and instruments. It should be made clear to the governments and local authorities of those countries that our aim is not national aggrandisement or personal profit in the commercial sense, but simply the betterment of the service that optometry can provide for the eyesight of the people.

GENERAL INFORMATION SERVICES

As soon as one begins to study international optometric co-operation it becomes clear that the problem is too large and too vital to the wellbeing of mankind to be left to isolated haphazard piecemeal spasmodic activity, however intelligent and well-meaning it may be. Some kind of overall co-ordination is called for: on the analogy of the human body, the international optometric body needs a central nervous system with sensory and motor nerves bringing information in and initiating appropriate action. In other words we have reached the stage when we should have an international information service supported by all the nations and all the organisations who stand to benefit from an improvement in the standard of optometric knowledge, status and practice. There should be some centre into which there was constantly being fed information relating to optics, optometry and ophthalmology from all over the world, from large nation-wide bodies like the Zentralverband der Augenoptiker, the British Optical Association, the American Optometric Association, down to single correspondents in little-known outlying areas.

An international book centre could be set up where a representative collection of textbooks and other literature could be held for inspection assessment, review, reference and translation. An exchange system could be set up for the world's optical and optometric journals, with the appropriate translation and abstracting facilities. Lists should be compiled and kept up to date of all the optical, optometric, and ophthalmological periodicals in the world. I receive regularly in my own practice 45 optical and optometric journals from 22 different countries, most of them on an exchange basis for the one I publish myself. I know the list is far from complete. No one man has the time or the knowledge of languages to do full justice to the mass of information thus acquired: but given adequate support he could act like a traffic policeman, controlling and directing the flow. One envisages that by this means, for example, a contact lens specialist in Chile who speaks nothing but Spanish could be provided with an abstract or a complete translation of an article on corneal nutrition which has appeared in a Russian medical journal.

Our proposed information centre could perhaps issue its own periodical newsletter digest in which the highlights of the previous month or quarter were collected and arranged in orderly fashion for rapid perusal, with clear references to the sources of fuller information if required.

Larger and more permanent reference works could be compiled and made available to interested parties. One effort along these lines was the international optical vade mecum on optical organisations, qualifications, schools, etc., which Mr. Eric Bateman and I compiled for the I.O.L. last year.

Such work requires time and money, and also willing intelligent co-operation on the part of those who supply the basic information and statistics. It has to be kept constantly up to date if it is to be of real value. One cannot expect even the most willing of people to continue it indefinitely on a voluntary unpaid basis alongside their ordinary work. Ways and means should be found of supporting jointly an international information bureau for optics and optometry, and bringing to a focus there all the activities I have referred to and others.

As we leave the subject, whether or not any of these suggestions bear fruit, let us glance back and take a bird's eye view of the whole.

In whatever country I travel I find optometrists commenting on the differences between optical practice in their own country and abroad. Wide differences do undoubtedly exist between the way optometrists do their work and the way the profession is organised and controlled in London, Berlin, Paris, Bern, Copenhagen, New York, Tokyo. But what is also clear to me is that we have a common origin in the 13th and 14th century spectacle makers of North Italy and South Germany: and whatever divergent paths we have taken our ultimate aim is the same—service to the ametropic and presbyopic members of the community, pooling our resources and working as a team, drawing on the best and latest knowledge and experience which the optometrists and ophthalmologists of the world have to offer, irrespective of nationality, race, colour, religion, frontiers or political creed.

19 CHILWORTH MEWS
LONDON, ENGLAND

SPECIAL REPORT

OPTOMETRY AND THE AGING PATIENT*

Monroe J. Hirsch†
Ojai, California

The number of older people has been steadily increasing in recent times. Senator Pat McNamara has said, "Of all persons who ever reached the age of 65 since the dawn of mankind, 25 percent are alive today."

In the United States the number of senior citizens, those over 65, is now 16 million; by 1970 the number will be 20 million. As this trend continues, there will be marked sociological changes. The society we have known in which a small fraction of the population lived to 65 will differ in many respects from the society of the future.

When we think of the vision needs of these senior citizens, certain facts are clear. As a result of presbyopia, almost every one of these people requires some form of optical aid. Moreover, there is nothing sacrosanct about the age of 65, for the signs of decline begin earlier. This is true physiologically and will be sociologically apparent in the future.

Finally, it should be noted that aging is accompanied by many vision changes. The 25 year span from 45 to 70 is characterized by many changes in contrast to the 25 years immediately preceding, from age 20 to 45. Thus, the proportion of older persons is increasing rapidly, almost all of them require ophthalmic aid, and the aid required changes from year to year. Very clearly this segment of our population is now the major recipient of optometric services. This group needs optometry.

Consequently, we have a group of people important to optometry and to whom optometry is important. To treat these people with the best care, optometrists must understand their special needs. But what are these special needs?

An excellent review has just appeared in the SATURDAY REVIEW (Jan. 28, 1961). It is by Robert and Leona Train Rienow and is titled "The Desperate World of the Senior Citizen." We shall quote liberally from this paper.

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*Read before the annual meeting of the California Optometric Association, San Francisco, California, February 18, 1961. For publication in the April, 1961, issue of the AMERICAN JOURNAL OF OPTOMETRY AND ARCHIVES OF AMERICAN ACADEMY OF OPTOMETRY.

†Optometrist. Ph.D. Fellow, American Academy of Optometry.

The Reinows sum up the problem of aging individuals as follows: ". . . the overriding reason for unrest among the senior citizens is not the lack of health or money. What our retired elders yearn for more than anything else is involvement. They are crushed with the feeling of no longer being wanted, useful, important to others. They have been stripped of their value—and so of their dignity as human beings."

Further along the Reinows point out that ". . . Our mistake began when we confused and identified the problem of aging with the economic question of retirement."

Old age clubs and golden age clubs are not the solution for many of the senior citizens. The Reinows relay the feelings of some of these older people with these quotations:

"Don't rig up childish entertainment for us. . . . These kiddy sing songs and charity programs are an insult to what intelligence we have left."

"Don't make problems of us. Don't give us planned recreation. We want to stay people."

The Reinows sum up the feeling of many of the senior citizens this way: ". . . they cannot bear degradation of their former standing. They shy from the term 'aged' and cast about for a badge of honor. They refuse to speak of themselves as 'we' or 'us.' Socially, senior citizens fight the very 'we feeling' that their would-be leaders are trying to build up in them politically."

The sociological problem is tallied by the Reinows as follows: "Our old people are caught up in the backwash of a technological civilization in which industrial uselessness has not yet been compensated for in terms of social adjustment. In establishing an arbitrary age of obsolescence, we have not counterbalanced the hardships of economic discard with any measure of social prestige." This is the sociological problem.

Optometry cannot solve it. It can, however, operate within the framework of this problem. Interestingly enough, optometry already does just this.

Clearly, the greatest need of the older patient is to be treated as a useful individual, not as a member of the "aged population." Let us consider just one optometric application of this concept.

A rule was once promulgated that trifocals are for desk work. Ergo, when a patient retires he no longer needs the intermediate segment since he is no longer doing any mid-range work. To be sure, this may be true of some patients, but, for the most part, it should be clear that this is the very thing that should not be done to all older patients. This taking away of trifocals has the air of "you're through . . . turn in

your suit." The total need of the total individual must be considered.

Another need which the older patient has is time. He needs time to explain his problem, time to make judgments in a subjective examination, and time to understand the status of his vision and what will be done about it. The very thing the older patient does not want is to be pushed through a mill, leaving him with the feeling that he is the slag.

A striking need of the older patient is reassurance. He has been bombarded with stories about blindness. His concept of blindness is different from the scientist who thinks of reduced vision, not complete absence of vision. Thus, when he consults the optometrist and describes a minor symptom, what the senior citizen really wants to say is, "Will I spend my last years in darkness?" The optometrist must recognize this need and fill it. This takes warmth and understanding, but most of all, it takes time.

There is often a suggestion that optometric geriatric clinics or geriatric specialists would be desirable. The Reinows, however, state that ". . . geriatric clinics, set up with special consideration for the needs of the aged, are almost universally unsuccessful." They go on to quote Dr. Monroe as saying, " 'People do not want to be segregated on the basis of age. . . . If one goes to a geriatric clinic he must expect to be treated there according to the downgrading our contemporary culture holds for the aged.' "

Here again we see that optometry is ideally suited to fit into the pattern desired by older patients. For the most part, optometrists *do* have general practices. They consider children's vision, industrial vision, contact lenses, visual training, subnormal vision, and geriatric vision as parts of the general practice of optometry and not as separate specialties. This is apparently what the older people want.

Another need which older patients have is for the accessibility of their doctor's office. Optometrists tend to settle in smaller communities and locate their offices in easily reached spots. From the viewpoint of the older patient, this is exactly what optometrists should do.

Let us now sum up some needs of the older patient: An accessible ophthalmic practitioner who will listen to his problems and discuss them and treat him as an individual rather than a special problem.

The present day optometric practitioner satisfies these needs of the aging patient. Optometrists *are* accessible. Optometrists *do* recognize the need to treat patients as individuals. Optometrists *do* gear their practices to give enough time to each patient. Optometry *is not* run as a mill through which a large number of characterless patients move and where a pair of spectacles is considered the end of the service.

One other need is also apparent in our society, for the older people often do not have the money to pay for services. Someone must help pay the bill. This leads to optometry's real problem. We must find a way to make these services available, enable the doctor to retain his close relationship to the patient, enable him to spend the necessary time, enable him to maintain an accessible office, enable him to fill the patient's needs, and still be compensated.

To this major problem we cannot even try to give a complete solution here. We can, however, offer a yardstick for evaluating any plan which may be set forth. The ideal plan, very simply, is one which will allow the optometrist to satisfy the patient's needs as he is now doing and yet be compensated by a third party.

We all remember the O. Henry story of "The Gift of the Magi." The husband, in order to give his wife a handsome comb for her beautiful hair, sold his watch. His wife, in order to give him a chain for the watch, sold her hair. While such self-sacrifice makes a charming Christmas tale, we question the wisdom of similar sacrifices in vision care. In the act of making vision care available to the aging patient we must avoid sacrificing the very things he needs in this service—time and individual attention.

Optometry's problem is to bring before the "third parties" in health care this story. Optometry is now coming closer to filling the vision needs of the older population than any other group. Optometry is ideally constituted to do this and to do it in the manner most agreeable to older patients. For the good of the patient, optometrists object to giving up any needed aspect of such service. Optometrists recognize that payment plans are needed, but the carrying out of these plans often tends to destroy all or part of the service which should be offered. The only acceptable payment plans for both patient and optometrist are those which do not interfere with the present high quality of the service.

Optometry has made a distinct contribution to the senior citizens by offering the ophthalmic service which these people need and want. The problem for the coming years is to find a way which, by working with governmental bodies, this service will be available and economical but with no dilution or perversion of the services. This is the challenge optometry faces in the '60's.

216 EAST MATILIJA STREET
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CURRENT COMMENTS

Terry Judith Parkins
Editorial Assistant

Optometrists will confer a favor by sending news items of general interest for this department; such as relate to new instruments, clinical techniques, education, visual health and optometric legislation and organization.

ANNUAL CONGRESS—AMERICAN OPTOMETRIC ASSOCIATION

The annual Congress of the A.O.A. will be held at Denver, Colorado, June 17-20 at the new Denver Hilton Hotel. A strong educational program is planned around contact lens fitting. Advanced Registration is urged. The fee for optometrists is $25 and for wives is $20. These fees are advanced $5 each on June 1. Advanced registration should be sent to the A.O.A. office, 4030 Chouteau Avenue, St. Louis 10, Missouri. For Hotel Reservations optometrists are urged to write to the Denver Visitors Bureau, 225 W. Colfax, Denver 2, Colorado. An outline of program follows:

SATURDAY, JUNE 17

9:00-10:00—House of Delegates
10:30—Official Opening of Congress
1:00- 4:00—Educational Clinics
1:00- 5:00—House of Delegates
7:00-10:00—Square Dancing

SUNDAY, JUNE 18

9:00-12:00—House of Delegates
9:00-12:00—Educational Clinics
12:00—Awards Luncheon
2:00- 6:00—Educational Lecture Series
7:00-10:00—Educational Clinics

MONDAY, JUNE 19

9:00-12:00—General Education Session
University of Denver (Downtown Campus)
1:00—Exhibits Prize Drawing
2:00—Family Outing—Western Style
Tour of Air Force Academy.
Trip to Garden of the Gods.
Chuck Wagon Barbecue.

TUESDAY, JUNE 20

7:30—Military Optometrist's Breakfast
9:00-12:00—House of Delegates
9:00-12:00—Military Workshops
9:00-12:00—Educational Clinics
1:00- 4:00—House of Delegates
1:00- 4:00—Educational Symposium
6:00- 7:00—Cocktail Hour
7:00—Banquet and Dance

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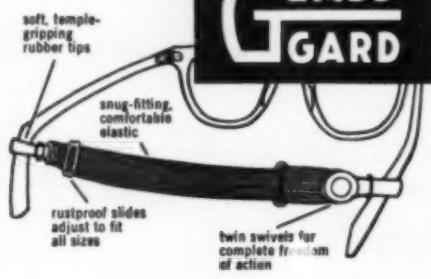
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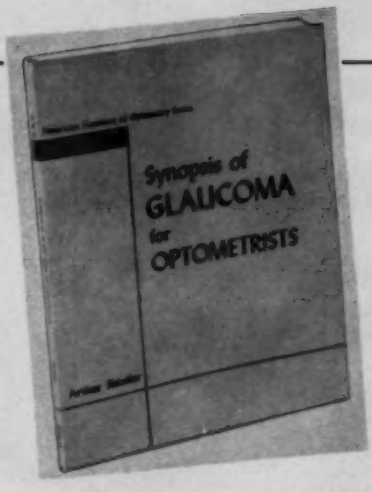

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Pennsylvania State College of Optometry

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ELMER S. FRIEDBERG, O.D., F.A.A.O.
Journal of the American Optometric Association

"This book fills a long felt need in optometry. The phenomenal sale of this volume indicates that thousands of other optometrists will equally benefit by owning and using it regularly. The book should be read and then kept in full view in the refracting room where its presence on the desk of the optometrist will do much to assure patients who are apprehensive regarding this pathology.

CAREL C. KOCH
Secretary F.A.A.O.
American Journal of Optometry

Usable for both the practicing optometrist and in the classroom, this book is the first in a series of home study courses, published by the American Academy of Optometry, intended to round out its work in postgraduate education. The author is a practitioner as well as an educator. His work covers etiology, clinical signs, symptoms and screening tests used to facilitate the understanding of glaucoma detection and referral.

The subject matter is designed to present the noticeable features of glaucoma to facilitate detection by the optometrist, and subsequent referral to an ophthalmologist.

In addition to this information, all aspects of the disease are covered so that the optometrist will be familiar with procedures used by the ophthalmologist in treating cases which he has referred.

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